WB0183

Computerisation of Land Records: Building on Karnataka's Experience

Final Report (Draft)

September 2004

Note:

This report is based on a preliminary draft prepared by Land Equity International Pty Ltd in September 2004. The report was circulated to key individuals for internal review. The report was subsequently revised in the light of comments and suggestions that were provided by Klaus Deininger from the World Bank and Tim Hanstad from RDI.

The report has no endorsement from the World Bank or DFID and is not to be quoted or referred to as a reference document.

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17 January 2005

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Units, Glossary and Acronyms

1. Units

Lahk	100,000 (one hundred thousand)
Crore	10,000,000 (ten million), or 100 lahk
Gunta	2,500 square links or about 101.17 square metres
Acre	40 gunta, or about 4,046.856 square metres
Hectare	10,000 square metres, or about 2.471 acres
45.0 Rupee	US$1 (September 2004)
Financial year	April to March

2. Glossary

Akarband	Record of the revenue assessment for each parcel on the village map
Bhagidi	Sharecropping
Bhoomi	Land
Carta	Card
Chak	Single compact block produced in land consolidation
Crore	10,000,000
Grama	Village
Hissa survey	Survey undertaken to pick up subdivision since the original village settlement surveys.
Hubli	Group or ‘circle’ of villages
Jamabandi	Yearly closing
Khata	Ledger extract that sets out land details
Khatedars	Group of cultivators
Lakh	100,000
Mutation	Change in the land records
Pakka book	Survey computation book
Panchayat	Local self-government
Prapthi	Assessment book prepared during settlement surveys
Patta	Documentary evidence of rights in land issued by the proscribed officer.
Phodi	Subdivision of a parcel
Quickbird	Private American satellite earth observation satellite with a ground resolution of 0.6 metres
Revenue Inspector	Chief revenue officer at the circle (hobli) level.
Tahsildar	Chief revenue officer at the Taluk level
Taluk	Block, an administrative unit, less than a District (Zilla) and greater than a village (Grama)
Tippan	Field book
Zilla	District

3. Acronyms and Abbreviations

ADB	Asian Development Bank
ADR	Alternate dispute resolution
ADLR	Assistant Director of Land Records
BDA	Bangalore Development Authority (covering about 630 km^2)
BMA	Bangalore Metropolitan Area (covering about 1,537 km^2)
BMP	Bangalore Mahanagara Palike (Bangalore City Corporation, covering about 206 km^2)
BMR	Bangalore Metropolitan Region (covering about 8,600 km^2)
BMRDA	Bangalore Metropolitan Region Development Authority
CAD	Computer-Aided Design (Mapping)
CDP	Comprehensive Development Plan
COLR	Computerisation of Land Records, a central sector scheme with full funding by GOI
DFID	Department for International Development (UK)
DMA	Department of Municipal Administration
DGPS	Differential GPS (satellite positioning system based on simultaneous satellite observations of a point of known position and a point of unknown position)
EDM	Electronic distance measuring, a survey instrument that accurately measures distances
GDP	Gross Domestic Product
GIS	Geographic Information System
GOI	Government of India
GP	Gram Panchayat
GPS	Global positioning system, a US satellite positioning system
IGSR	Inspectorate-General of Stamps and Registration
ISEC	Institute for Social and Economic Change
ISRO	Indian Space Research Organisation
JDLR	Joint Director of Land Records
KAVERI	Karnataka Valuation and e-Registration
KIDB	Karnataka Industrial Development Board
KSRSAC	Karnataka State Remote Sensing Application Centre (an autonomous agency with ISRO affiliations)
LDA	Local Development Authority
LIS	Land information system
LISS III	Linear Self-Scanning Sensors III, a satellite imaging system developed by ISRO which scans four bands at a resolution of 23.5 metres with a swath of 141 kilometres.
MDA	Municipal Development Authority
MSDIP	Metropolitan Spatial Data Infrastructure Project
NIC	National Informatics Centre
NRSA	National Remote Sensing Agency (part of ISRO)
NSS	National Sampling Surveys
NOC	No Objection Certificate
RI	Revenue inspector
ODP	Outline Development Plan
ROR	Record-of-rights
RTC	Record-of-Rights, Tenancy and Crop Inspection
SI	Survey of India
SPOT 5	French space imaging satellite system with coverage of 60 km by 60 km and a resolution of 2.5 metres to 20 metres.
SSLRD	Survey Settlement and Land Records Department
TPD	Town Planning Department

TPS	Town Planning Scheme
UDA	Urban Development Authority
UNDP	United Nations Development Program
WAN	Wide-area-network

EXECUTIVE SUMMARY

Over the past few decades land records for agricultural land in India have become increasingly dilapidated. For urban and non-agricultural land in rural areas no system clearly sets out rights over land. This uncertainty in rights in land undermines the objectives of good governance and poses a serious threat to social stability and economic development. Governments have invested in the computerisation of land records, but institutional and regulatory constraints have greatly reduced the benefits to be obtained from computerisation.

Karnataka has successfully computerised its land records and is now seeking to build on this success and expand the capabilities and coverage of the system. This report reviews the system in Karnataka and recommends a five-year plan. The report also captures a broader set of lessons that may benefit other Indian states.

The following major issues have been identified in Karnataka in this study and serve as the framework for the options for improvement:

- there is a weak spatial framework for the RTC system. The original data has low accuracy, village maps have been prepared with non-standard methods, the maps are not up-to-date, there are long delays in Phodi, mutations are recorded without survey and the data is not geo-referenced;
- there is a lack of both map and textual information in urban areas. The SSLRD City Survey Plans and associated Property Cards only cover parts of 48 urban centres. This information is not up-to-date and does not reflect the reality on the ground. The municipal property tax registers (Khata) do not have a spatial component and are incomplete;
- many of the field records for settlement surveys are very old and in fragile form and the records have not been backed-up;
- the registration system does not include the adjudication of rights and the resolution of disputes and does not ensure the validity of a transaction. The system is not map based and there are poor descriptions of property;
- while Bhoomi has been successful, it is essentially a computerisation of a very old land revenue system. A number of issues arise, including inconclusive records and cumbersome procedures (e.g. the mutation process).
- Several departments maintain land records systems and none are comprehensive or conclusive.

Based on the perceived problems in the existing system, the future needs of the state and on recent international trends, the following long-term vision for Karnataka is suggested:

> *A single, unified, comprehensive, cost-effective and up-to-date system to record rights in land that ensures security of title to landowners and provides land parcel information to Government and private users.*

The report investigates a number of alternative strategies for Karnataka to address these problems, and the following four objectives and short-term actions to achieve these objectives are recommended.

Objective 1: Strong spatial framework for land records in both rural and urban areas.

1.1 Archive the tippan records.

1.2 Reach agreement with TPD, BMP and DMA on access to base mapping and tax maps/attributes.

1.3 Prepare functional specifications and design to modify Bhoomi to accept spatial data (vector village maps and BMP/DMA tax maps)

1.4 Transfer/validate/input village maps, BMP and DMA tax mapping in a form suitable for the re-engineered Bhoomi.

1.5 Ensure phodi before registration, streamline the phodi process, ensure successful involvement by a strong private survey sector and develop and implement a hissa program to address phodi backlog.

Objective 2: A comprehensive spatial information system on rights in land, based on Bhoomi, extended to cover urban and non-agriculture land.

2.1 Study into the current and future user needs of the RTC and where agriculture data is best captured and maintained.

2.2 Re-engineer Bhoomi (categorising data types) and incorporate spatial data.

2.3 Input appropriate attribute fields from BMP/DMA data.

2.4 Validate data (with KAVERI, publicity campaigns, put information on the web, provide verification extract to each property holder)

2.5 Deploy Bhoomi in kiosks in Sub-Registries and on the internet, and use Bhoomi in the Sub-Registries as an aid to registration.

2.6 Maintain Bhoomi with link to KAVERI.

Objective 3: Certainty in Rights in Land.

3.1 Develop policy and principles for a registration of title system.

3.2 Prepare functional specifications and design to formulate a registration of title system (including private and public land).

3.3 Draft and obtain enactment of appropriate legislation.

3.4 Establish the title registration system using Bhoomi property data.

3.5 Functional reorganisation and staff training.

3.6 Piloting of an incremental program to issue titles with public notice and replace existing systems.

Objective 4: Single land administration agency.

4.1 Review of functions in land administration agencies (Revenue, SSLRD, and IGSR)

4.2 Prepare a detailed integration strategy, including the funding and finance requirements.

4.3 Prepare rules and regulations to support new institution.

4.4 Progressive implementation of strategy.

CHAPTER 1 - INTRODUCTION

1.1 Background

Over the past few decades land records for agricultural land in India have become increasingly dilapidated. For urban and non-agricultural land in rural areas no system clearly sets out rights over land. This uncertainty in rights in land undermines the objectives of good governance and poses a serious threat to social stability and economic development. For these reasons the computerisation of land records has long constituted a key element in the Government of India's (GOI's) strategy for the land sector. However, despite considerable efforts, and with the notable exception of a few states, progress has been slow and erratic. Institutional and regulatory constraints have greatly reduced the benefits to be obtained from computerisation.

The Government of Karnataka has asked the World Bank to arrange a study to identify ways in which the accomplishments of the successful computerisation of land records in Karnataka can be built upon and expanded. This study was to set out concrete mechanism for doing so.

The study also has the objective of capturing a broader set of lessons that may benefit other Indian states.

The terms of reference for the study are set out in Annex 1.[1] The study was supervised by Klaus Deininger of the World Bank.

1.2 Approach

There have already been assessments of the benefits from the program to computerise land records in Karnataka, focusing on improved transparency and accountability at the local level. The study therefore focuses on challenges ahead rather than on demonstrating what has been accomplished in the past.

The main emphasis of the study was to arrive, through interaction with policy makers and technical staff and by reference to international experience and best practice, at very specific and concrete suggestions on how shortcomings in the legal, technical, and administrative area can be addressed. This has been translated into a long-term strategy and concrete five-year action plan which was discussed with the relevant authorities in a workshop on 6 September.

1.3 Methodology

This study was funded by DFID and was undertaken by Land Equity International Pty Ltd of Australia. The consultants conducting the study were Tony Burns and Kevin Nettle. The key counter-part in Karnataka was Sri Rajeev Chawla, the Secretary e-Governance and Special Secretary (Bhoomi) Revenue Department. The consultant team arrived in Karnataka on 21 August and left on 11 September. Whilst in Karnataka the consultants, working with counterparts assigned from the Bhoomi Monitoring Cell, met a wide range of stakeholders involved in maintaining and using the land records systems (see list of contacts in Annex 3). The Sub-Registry in

[1] The terms of reference make mention of a review of initiatives in the state of Maharashtra. This was not possible during the assignment in India and additional time was spent in Karnataka.

Cauvery Bhavan was visited to review the operations of the computerised registration system (KAVERI). A field trip was undertaken to Mandya District to consult with local staff and to review the field operations of Bhoomi and KAVERI and to review the pilot re-survey activity in Maddur Taluk. A workshop of key stakeholders, chaired by the Revenue Minister was held on Monday 6 September (see Annex 2 for a copy of the Aide-Memoire and Workshop Minutes). The objectives of the workshop were to present the initial key findings of the study, with an emphasis on the concrete action plan, to key stakeholders and seek stakeholder feedback. Klaus Deininger was in Karnataka from 4 to 8 September and was a key participant in the Workshop.

There is a significant amount of background material on land administration in India and Karnataka and recommendations for improvements. An essential part of this study was a review of key references (listed in the references on page 62). The reports by Professor Wadhwa were particularly germane.

Land administration in India and Karnataka operates within the complex environment of land policy. A key review of this wider environment is the recent report by Hanstad, Neilson and Brown (2004). Hanstad et al specifically review key topics that impact on land administration, including land reform, land allocation, access to land by vulnerable groups, the conversion of agricultural land to non-agricultural use, the management of forest land and land consolidation. This study does not attempt to cover these important topics.

CHAPTER 2 - KARNATAKA

2.1 Brief Review of Context in Karnataka

Karnataka is the eighth largest state in India, with a population of about 53 million. The state covers about 5.8% of the country's land mass and about 5.3% of the population. Karnataka is one of the fastest growing states, with the state annual GDP growing from 5.3% in the 1980s to 7.3% in the 1990s. Over the past decade agricultural input has increased based on diversification and increases in productivity, rapid manufacturing expansion has contributed to growth in industrial output and there has been significant growth in services, led by software exports. However despite rapid growth Karnataka is still a very poor state, poorer than the Indian average. Agriculture and associated activity accounts for about 37 percent of state income and about 69 percent of state employment. Factors that impact on the rural sector are low average land holdings and a high reliance on rain-fed agriculture.

Karnataka has realised significant achievements in the computerisation of land records. Efforts to computerise land records began in 1991, but the program was not completed until March 2002. The Department of Revenue has now computerised 20 million records of land ownership for agricultural land held by 6.7 million farmers. The new system, **Bhoomi**, has made the system of Record of Rights, Tenancy and Crop Inspection (RTC) more transparent and much less subject to illegal alteration. Farmers can readily get certified copies of their RTC records at a low fee. Although the records have been centralised at Taluk level, there are plans to decentralise access to the records through a network of village kiosks.

There is consensus that while great progress has been made in Karnataka in the computerization of land records through Bhoomi, the full potential is not realised for a number of reasons, including:

- First, the system has been designed to deal with a legacy of past records, rather than a new process that was designed comprehensively from the ground up. As a result only a small part of the potential efficiency gains from computerisation is being realized. Inefficiencies and duplications in the system and in the data in the system remain;
- Second, land records do not provide conclusive proof of ownership;
- Third, the spatial extent of land holdings is often unclear; and
- Finally, while it may have made sense to focus on agricultural areas in order to establish the system and demonstrate its feasibility, there is little doubt that at this point extension of the system into urban areas and non-agricultural areas can significantly increase economic benefits.

2.2 Brief Review of Systems and Processes

The following section sets out a brief overview of the current land administration systems and processes in Karnataka. More details on the system are available in Burns and Despande (2001) and Saxena (2004).

2.2.1 Systems

Land Revenue Act System. The original settlement surveys[2] of Karnataka were undertaken under the British administration over a period of about 30 years from 1863. The primary aim of the settlement surveys was the generation of records to support the raising of revenue. Hence the British implemented very simple techniques. Unlike other States in India, the re-settlement surveys in Karnataka have not been repeated at regular intervals, although re-surveys have been undertaken in parts of Karnataka.[3] A partial re-survey was undertaken from about 1930 to 1950 to pick-up subdivisions (the Hissa survey). The Hissa survey was not a full resurvey, and information was only collected for parcels that had been subdivided. The settlement surveys have a prescribed periodicity of 30 years but further settlement surveys have not been undertaken.

The surveys were and continue to be conducted as local village surveys, without connection to the national geodetic framework. All parcel boundaries are monumented, and the boundaries are fixed as the straight lines joining the boundary monuments. In each village a baseline is established. Boundary monuments and major topographical features such as roads, paths, streams and tanks are picked up as square offsets from the baseline. Individual parcels are detailed in field books as isolated surveys with their own baseline or baselines. Areas for each parcel are calculated by breaking the parcels down into constituent triangles. The village boundary is also picked up as an individual parcel and is used as the outer boundary for the compilation of the village map. The information recorded in the field books is used to compile the village map, which is usually prepared at a scale of 1/7,920. Every village has a map, with some bigger villages having more than one map. There is a total of about 30,500 village maps in Karnataka.

The maps are prepared on paper and some of the older maps are in frail condition. One copy of every village map is held in the head office in Bangalore, and multiple copies of each map in the Taluk offices for public records and sale to the public. In the head office the village maps are manually mosaiced to form Taluk maps, usually available at a scale of 1/62,360. The Taluk maps are in turn manually mosaiced to form District Maps at a scale of 1/253,440, which in turn is mosaiced to form a State map at a scale of 1/1,000,000.

All the legal parcels surveyed during settlement surveys were assigned a number that is unique to the village.[4] This number is called the survey number and is the basic reference for information concerned with the land parcel. Where a parcel is subsequently subdivided, the original survey number is a reference for the new parcel numbers. For example, if parcel number 243 in a village is subdivided into two

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[2] Settlement surveys are surveys undertaken to clearly map and define public and private rights in land and to set an equitable basis for land revenue. Systematic settlement surveys in India were implemented from the 1860s, as part of a strategy to improve State Revenue. Very simple survey techniques were adopted.

[3] The land records in Tumkur Taluk in Tumkur District indicate that a re-survey was undertaken.

[4] Although there is anecdotal evidence that there is some duplication in numbers, and this would be a serious issue for the registration system which in rural areas relies on the survey number as the prime reference to land parcels. Problems associated with the non-uniqueness of survey numbers is reported in the Circular from the Additional Secretary to Government, Revenue Department, concerned with the Update of Land Records, dated 14 August 2000.

parcels, the two new numbers will be 243/1 and 243/2, with the original landholder, if he retains one of the parcels, being assigned the number 243/1. If the parcel is further subdivided, the next available number is used – for example if 243/1 is subdivided into two parcels, the two new numbers will be 243/1 and 243/3.[5]

The Land Revenue Act sets down that for every urban area with a population of more than 5,000, city survey maps may be prepared.[6] However, city survey plans have only been prepared for 48 cities. The City Survey maps are not evenly distributed in Karnataka. In the former Belgaum Division, where the land records were established under the Bombay system, there are City Survey maps in the two major urban areas, Belgaum and Hubli-Dharwad, and in 40 other urban centres ranging in population down to small villages (hubli). In the former Gulbarga Division City Survey maps are only available in Gulbarga. In the former Bangalore Division City Survey plans are available in Bangalore, Davanagere and Kolar Gold Fields. In the former Mysore Division only Mysore has City Survey plans. Even so, these City Survey plans only cover part of the urban areas. In Bangalore 98 Local Area maps have been prepared covering about 118 km^2 of the city, leaving about 206 km^2 to complete the villages declared to be part of Bangalore city[7] and Bangalore city is only a part of the Bangalore Metropolitan Area (BMA) which covers 1,357 km^2. City survey plans are compiled graphically without connection to the national geodetic framework. Plane table surveys are undertaken picking up roads, parcel boundaries and building outlines. These plane table sheets are prepared at a scale of 1/500. The plane table sheets are used to compile the city survey plans, which are prepared at a scale of 1/2,500 and show only roads, parcel boundaries and parcel numbers (city survey numbers). These numbers are unique to the Local Area Map. These maps have been produced over the past few decades and any updating of these maps is slow at best.

Surveyors from the Survey, Settlement and Land Records Department (SSLRD) have traditionally undertaken all cadastral surveys. These surveys are undertaken to re-establish boundary marks and to carry out subdivisions (phodi). Surveys are also undertaken to grant public lands and to support the compulsory acquisition of private land by the State. Surveys are not undertaken to consolidate land holding, despite some demand for this, as there is no legal provision to consolidate land holdings.

Maintenance of land records is the joint responsibility of the Revenue Department and SSLRD. The Revenue Administration of the State is divided into 27 Revenue Districts, 49 Sub-divisions, and 177 Taluks. The administrative set-up of the SSLR department is such that for each Revenue Division has an Assistant Director of Land Records (ADLR) for each Revenue Sub-Division. At Taluk level there is no senior SSLRD officer. There are Surveyors equivalent in rank to Senior Clerks, with no unified command at Taluk level, although this will change with the recent decision to merge the SSLRD survey staff with the Revenue Department, with the surveyors reporting to the Tahsildars.

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[5] As noted in the Circular from the Additional Secretary to Government, Revenue Department of 14 August 2000, not all parcels are labelled as required by regulation and some parcel numbers on RTCs have a alpha character – examples quoted in the Circular included 23a, 56/b1, and 100a.

[6] Section 148.

[7] The city areas are declared in units of village and are published in the Government Gazette.

The basic document for land is the RTC (Record of Rights, Tenancy and Crop Inspection), the original of which was maintained with the Village Accountants and a duplicate at the Taluk office. The RTC gives particulars such as survey number, area, name of the owner(s), rate of assessment, type of ownership, soil type, sources of irrigation, particulars of trees, rights and liabilities, particulars of tenancy, if any, and particulars of the crops raised during each season and their coverage.[8] This document constitutes prima facie proof of ownership. In Karnataka there are 20 million records in the RTC, covering 27,000 villages and belonging to 6.7 million farmers. These records were originally maintained by 9,000 Village Accountants.

In those urban areas where City Survey plans have been prepared the RTC is not used, but details of ownership are maintained in a simplified document known as a "Property Card". It has been held that the provisions of the Land Revenue Act also apply to building sites in town.[9]

The second important land record is the village map that delineates different survey numbers. It is a very important tool in resolving boundary disputes. This document is maintained by SSLRD.

The third important land record is the Khata, a ledger showing land revenue, cess, water rates, and other government dues to be paid by a cultivator and the amount paid in a given year. For this purpose, each cultivator or a group of cultivators known as Khatedars is given a unique Khata number and the annual assessment for all the plot numbers held by him or them is totalled and payment particulars entered. The Khata register is prepared once a year during the jamabandi or reconciliation of the annual accounts. Khatas are maintained by the Village Accountants.

There is another important document known as akarband which records the land revenue assessment for each survey number in the village along with its extent and type. The original document is maintained by SSLRD and the Village Accountant maintained a copy in order to be in a position to crosscheck the correctness of the assessment shown in the RTC form. Other records include the Mutation Register and the Disputed Cases Register.

Whenever there is any change in ownership or other status of land through sale, inheritance, gift, exchange, partition, mortgage, and the like, the interested party may approach the Taluk office[10] for a mutation or details of a transaction may be forwarded by the Sub-Registrar after registration under the Registration Act, 1908. The particulars are recorded in the Mutation Register and put on public notice by the Village Accountant and also served to interested parties asking for objections, if any, within 30 days. If no objection is received and the Revenue Inspector is satisfied that the change is genuine, he 'certifies' the mutation. A consequent change is then made

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[8] The Karnataka Land Reform Act prohibits tenancy and sets out tough sanctions. There is limited political will to enforce these sanctions and Village Accountants reportedly routinely record the land owner or the family of the land owner as the 'cultivator'. As a result, information on tenancy in the RTC is very unreliable. There is also anecdotal evidence that Village Accountants do not conduct the field observations necessary to maintain the crop information and as a result this information is also unreliable (source: *Hanstad, private communication*).

[9] *Asanth Narayanya Tikare v Joint Director of Land Records, Belgaum and others* 1995(3) Kar. L. J. 481.

[10] At the Bhoomi kiosk. Formerly this application was made to the Village Accountant.

in the RTC. If mutation involves splitting an existing plot, then the details are given to SSLRD so that necessary changes can be made in the map.

Although the Land Revenue Act specifies a similar system for non-agricultural rural land, in practice there has been confusion about the role of the Gram Panchayat. However it has now been resolved that records pertaining to non-agricultural land will be maintained by Revenue Department in a form similar to property records in urban City Survey areas but mutations will require the approval of the Gram Panchayat.

The Land Revenue Act records are intended to include details on public land as well as private agricultural land. However, it is clear that these records have not been well maintained. A study (ISEC undated) on land tenure and land-use/land-cover of public lands in Dakshina Kannada district (Karnataka) found that the Jamabandi (annual accounts based on the RTC) is not properly maintained. The total of different columns often does not add up to the total geographical area of the village: out of 589 villages for which Jamabandi records were obtained, in 21 villages, the extent of this discrepancy was more than 500 acres, whereas in 54 other villages the discrepancy was between 20 to 500 acres. The Taluk Land Records offices also do not have the maps for all the villages in their domain, and virtually all the cadastral maps are out of date. For instance, in Belthangady Taluk, village revenue (cadastral) maps for only 29 villages out of the total of 81 villages were available with the office of the Assistant Director of Land Records. Lastly, the village-wise Jamabandi records are only available in the Taluk offices. Thus, no clear estimate of extent of public land in each land tenure category is available at the district level, whether village-wise or aggregated (Saxena, 2004).

Registration Act System. The Department of Stamps and Registration, which was formed as an independent Department in 1989, is headed by the Inspector General of Registration and Commissioner of Stamps. At the District level there are 27 District Registrars, one for each district. Below the district level there are 199 Sub-Registries, where land registration takes place, at the Taluk and city levels, each headed by a Sub-Registrar. In addition, there are Superintendents, other clerical and assistant level staff members.

The registration of changes in rights of land occurs at the Sub-Registry level in the Taluk in rural areas and cities in urban areas. The sub-registries operate under the direction of the Inspector-General of Registration and Commissioner of Stamps. The registration of dealings in rights in immovable property is governed by the Indian Land Registration Act of 1908 and the Karnataka Registration Rules of 1961 which provide for the registration of documents. Registration of documents is compulsory in some cases and voluntary in others. While registration may be necessary to give effect to the transaction, it does not ensure the validity of the transaction and, in principle the registrar will register all deeds submitted in the appropriate form.

The deed must be presented to the Sub-Registrar on the appropriate form with attached stamps and the appropriate fee paid. Both parties to the deed and a witness must attend. The parties can also submit a No Objection Certificate (NOC) from the Income Tax Department if the property is valued more than Rs 500,000, and in the case of land alienation, a NOC from the Tahsildar. Submitting these forms on application saves delays. The Sub-Registrar stamps the deed recording the date

of presentation. The registrar enters the details of the application for registration in the Daily Register. The registry also maintains a Thumbprint register. The two parties certify their agreement with signatures and thumbprints on the deed and this is witnessed.

The registrar will then, if the land is declared to be more than 500,000 Rs, seek a NOC from the Income Tax Department and, for land alienation, a NOC from the Tahsildar, if these documents have not been submitted with the deed. It is understood that these processes take about a month.

The registrar will then enter the details in the register book. The Sub-Registry maintains four sets of registers:[11]

- Book 1, recording all dealings in immovable property.
- Book 2, recording all dealings that have been refused registration
- Book 3, recording all wills, codicils and bequests.
- Book 4, recording powers of attorney and other miscellaneous documents.

Once the details have been entered into the book, the registrar stamps the deed with an entry, recording a chronological number/year and the date of entry. This entry will be certified.

Following registration the registrar prepares a report (J-Slip), which is submitted to the Tahsildar in rural areas or the Assistant Director Survey, Settlement and Land Records in urban areas. These two officers will check the validity of the deed, and check records of public land. The J-Slip will be distributed to the local office, where the details will be verified with the original records. There is then a public notice of the dealing. If no objections are lodged in the specified time, the Tahsildar/Assistant Director will certify and make the appropriate entries in the records. In rural areas the Tahsildar will issue an RTC, and in urban areas the Assistant Director will issue a Property Card. This process will take at least 30 days, the period set down for public display.

In urban areas where the city survey is not in operation, an application has to be made along with a copy of the deed to the relevant Corporation/Municipal/Panchayat office to effect transfer of the Khata maintained by that organisation.

If the dealing is a phodi (sub-division) it will be passed to SSLRD for survey. There is a considerable backlog in the surveys for phodis but once the survey is completed, the information is passed back to the Tahsildar/Assistant Director for preparation of the RTC/Property card.

The sub-registries also supply encumbrance certificates. An application is made for the detailed history of a nominated parcel, usually identified by survey number in a village or street address or Corporation/Municipality/Panchayat Khata number in an urban area. The registry then provides a certificate on the registered dealings for this parcel over the stipulated period, usually 15 years. There is strong demand for this service. The registry is able to produce this information using two sets of cross-indices. These cross-indices are a village index, recording references to all dealings in a village and a name index.

[11] A fifth book, recording the details of sealed wills, is maintained in the District Registration office.

The linking of registration with the payment of stamp duty has the result that not all transactions relating to land are registered, as various means are taken to avoid stamp duty. In the case of mortgages it is the practice of many financial institutions to enter into an equitable mortgage by way of deposit of title deeds rather than a formal mortgage.

Local Authority Property Tax Assessment Records. Although the Revenue Department has the authority to map and record ownership in cities and towns it has only carried out limited work in this regard. For much of the urban properties the only documentary evidence of ownership recognised by the law is that contained in the records kept under the Registration Act. However, in practice, recognition is also given to the property tax receipts and the Khata records kept by the local authorities. Such records are not true records of ownership, but only evidence of taxpayers. For example, the Municipality Act, 1964 provides that the record is only presumptive. Nevertheless they are commonly used as supporting evidence of ownership.

Under these records each individual parcel is allocated a unique assessment number. The recording of changes in landholding is dependent upon new landholders notifying the local authority. Although it is recognised that these records are not complete, there are a large number of records in these systems. For example, there are 35 lakh urban properties within the Municipal records and Bangalore Mahanagara Palike has a database of 5.5 lakh properties. All these agencies are currently taking steps to improve their records

2.2.2 Data Flows

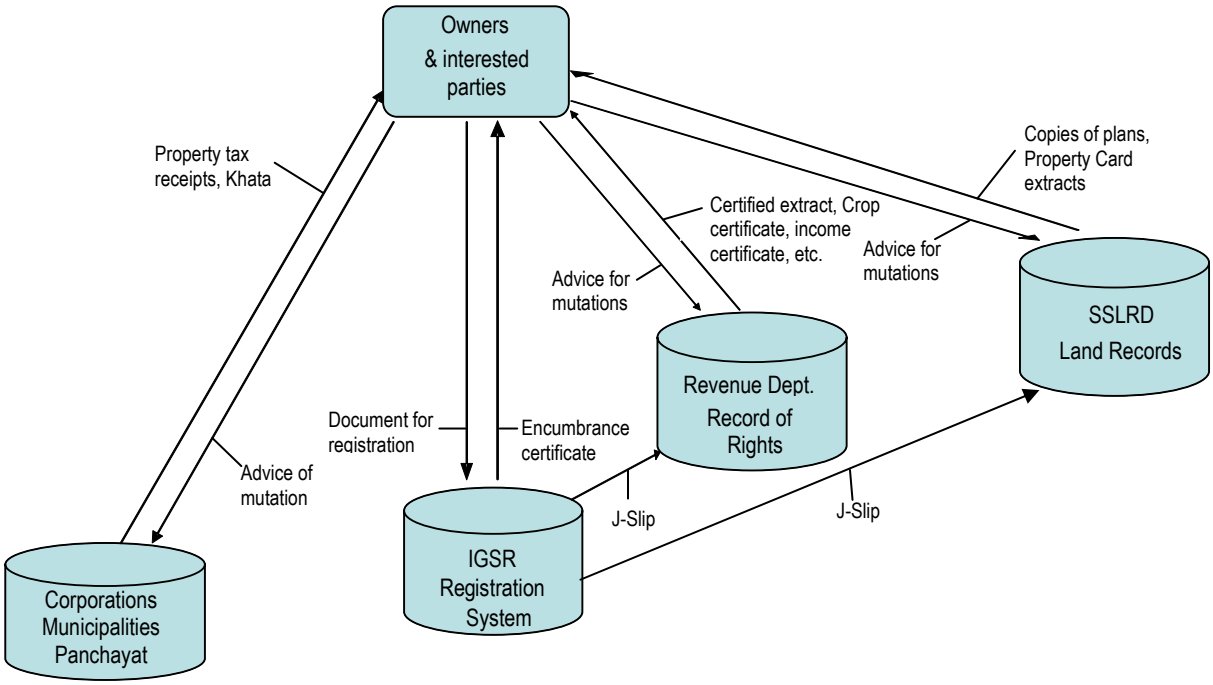
The major data flows between the four main land administration systems (Land Revenue RTC, SSLRD, the IGRS registration system and the various Khata maintained by the Corporations/Municipalities/Panchayat) and those seeking information on rights in land is illustrated in Figure 1. The main flows are:

- Requests from agricultural land owners for certified extracts from the RTC (for a range of purposes including trading in rights, borrowing against the land, arranging crop insurance and proving eligibility for certain government schemes and subsidies), as well as other requests such as requests for crop certificates and income certificates;
- Advice to the RTC system from land owners that a mutation has occurred and a request for adjustment to the records;
- Requests from land owners in City Survey areas for certified extracts from the Property Card;
- Advice to the City property card system from land owners that a mutation has occurred and a request for adjustment to the records;
- Requests from interested parties to the Sub-Registry for an encumbrance certificate on a particular property;
- Applications by interested parties to register deeds in the Sub Registry;
- Advice from land owners to the Corporation/Municipality/Panchayat that a mutation has occurred and a request to amend the Khata;
- Notice to property owners from the Corporation/Municipality/Panchayat of property tax owing and advice on information in the Khata;

- Advice, in the form of the J-Slip, from the Sub-Registry to the Revenue Department or SSLRD that a dealing in land rights has been registered.

As noted below, the three systems operate with very limited linkages and sharing of data.

Figure 1 - Land Administration Data Flows



2.2.3 Fees and Finance

In reviewing the current financial status of the land recording agencies it is necessary to look at the financial performance of the three main agencies, the Revenue Department, the Directorate of the Inspector General of Registration and Commissioner of Stamps and the Directorate of Survey, Settlement and Land Records. The overall revenue and expenditure for the agencies is summarised in Table 1.

Table 1 - Revenue and Expenditure for Land Administration Agencies.

Agency	Rs crore			Comments
	Income	Expend.	Surplus/ (Deficit)	
Revenue Department	108	159	(51)	Revenue is only Land Revenue, based on June 2004 figures. Figures for income and expenditure include Bhoomi.
Bhoomi	*13.0*	*101.43*	*(88.43)*	*Last 12 months. Expenditure based on estimate of Revenue Department staff working on Bhoomi, plus actual Bhoomi expenditure.*
SSLRD	1.65	43.44	(41.79)	2003/4 figures
Stamps and Registration	1,425.87	30.0	1,395.87	2003/4 figures. Includes stamp duty (a tax), plus registration fees (Rs 176.16 crore).

The Revenue Department had an estimated land revenue of Rs 108 crore and expenditure of Rs 159 crore for the 2003-04 financial year. Included in this figure

would be revenue and expenditure associated with land records. However the Revenue Department is responsible for the collection of land revenue and a large number of other government dues. In addition, it performs many other administrative functions and it is therefore necessary to apportion the salary cost of expenditure on land records. The land records component of Revenue Department is essentially Bhoomi and, as the operational costs and revenue of Bhoomi are known, the following figures can be deduced based on current salary levels and operating costs:

- Bhoomi revenue Rs 13 crore and expenditure Rs 101.43 crore.

Similarly in the case of Stamps and Registration Department many functions are performed other than registration of documents relating to land. However, stamp duty and registration fees are the largest revenue items and were responsible for income of Rs 1,249.71 crore and Rs 176.16 crore respectively in 2003-04, while total expenditure was Rs 30 crore.

For Survey, Settlement and Land Records Department revenue in 2003-4 was Rs 165.00 lakhs, while expenditure was Rs 4343.84 lakhs.

The basic fees for Bhoomi are 15 Rs for a copy of the RTC, 35 Rs for mutation request based on a pledge or mortgage and 20 Rs per parcel for a mutation request based on inheritance.

In the case of Stamps and Registration Department, while stamp duty and registration fees vary according to the type of transaction, for the most common transaction of a conveyance of property the stamp duty is 8% while the registration fee is 1%. The rates for stamp duty and the registration fee are significantly reduced rates that were introduced with effect from 1 April 2003.[12] In the year ending March 31 2004 there was an increase of 22.3% in the number of the documents registered and an increase of 24.4% in the total revenue from stamp duty and fees, even with the reduced rates for stamp duty and registration fees.[13] The costs associated with registering a transaction are still high and many transactions, particularly mortgages are still not registered, (the costs of a mortgage are 0.5% stamp duty and 0.5% registration fee). It is proposed to further reduce the stamp duty on conveyances to 5-6% by 2007.

Fees for Survey, Settlement and Land Records Department services are very low. The fee of Rs 35 for a subdivision survey would not cover the cost of providing the service. The fee for a copy or extract of records is Rs 10, recently increased from Rs 2.

[12] Previously the stamp duty was 10% for urban land, 9% for semi-urban land and 8% for agricultural land, and the registration fee was 2%.

[13] In 2002/2003 808,267 documents were registered and Rs 950.99 crore stamp duty and Rs 195.21 crore registration fees (total revenue of Rs 1146.20 crore) were collected. In 2003/2004 988,235 documents were registered and Rs 1249.71 crore stamp duty and Rs 176.16 crore registration fees (total revenue of Rs 1425.87 crore) were collected. Source IGRS figures provided by Deputy Inspector-General Thippannagouda.

2.3 Overview of Major Developments

2.3.1 Bhoomi

Bhoomi is an automation of the land records maintained under the Land Revenue Act. All 20 million records and 1 billion data fields have been computerised and handwritten records declared illegal.

Comprehensive data entry software was designed after extensive discussion. The data was captured in a phased manner. A print-out of the computerized record was then signed off by Revenue Department staff after comparison with the manual records and the manual records withdrawn. This process was completed and Land Records Kiosks became operational in all 177 Taluks in 2002. In every Taluk one Village Accountant has been designated as the Kiosk Village Accountant. Farmers may get a copy of their record on payment of user charges of Rs 15. Records are generated using the Bhoomi software running on kiosk computers and a back-end server holding the database. The records are signed by the Village Accountant at the kiosk. In case of any errors in the computerised records the farmers can lodge a request with the Taluk office to correct the records. Correction is made in the Bhoomi database if the error is found to be genuine and the corrected copy is then provided to the farmer free of cost.

When a change of ownership takes place through sale or inheritance, farmers can file an application for a mutation of the land record at the Bhoomi centre. Data from the application is entered and a check list is generated for manual verification of data and documents. Each request is assigned a number. The number can be used by the applicant to check the status of the application on a touch screen in the kiosk. Once the manual verification is complete an entry is made which automatically generates notices that are to be served to affected parties. In theory, after a period of 30 days from the notice date, if everything is in order, the Revenue Inspector passes the mutation order which is scanned into the system and after verification the system automatically updates the land record. There is anecdotal evidence that there are often significant delays in the mutation process.[14]

Crop records are supposed to be updated three times per year through the provision of the data to a private data entry agency, but there is anecdotal evidence that the field inspections necessary for the update of crop information are not being undertaken.[15] Check lists are generated after the update and validated by the Village Accountants before the data is entered into the Bhoomi database.

The maintenance of the system is the responsibility of trained Village Accountants who have been placed in each district to serve as resource persons for primary diagnostic and repair, while facility managers with service level agreements have been assigned to each kiosk.

The Bhoomi database from all 177 kiosks has been uploaded onto a central database. Also there are plans to decentralise Bhoomi to the village level and 20 pilot centres have been established in Mandya district. These private kiosks can connect to the Mandya database and view, print and distribute land records.

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[14] Private communication, Tim Hanstad.

[15] Ibid.

In another pilot 200 Village Accountants have been given hand held computers to carry out crop updates for 600 villages.

2.3.2 KAVERI

KAVERI is an automation of the registration process under the Registration Act, 1908, implemented under a private sector/public sector partnership. It has been in operation in all sub-registries since the first of December 2003. Features of the system at present include:

- Issue of an electronic token sheet with an allocation of time for presentation of documents.
- Following entry of data into the computer:
    a) Calculation of any delay and fine;
    b) Assessment of value and calculation of stamp duty and fees;
    c) Selection of required support documents;
    d) Generation of a check slip indicating whether document can be registered;
    e) Allocation of registration number;
    f) Generation of receipt.
- Use of a web camera and finger print scanning device for printing of identification details on document.
- Scanning of the document after registration.
- Automatic update of Books and Indexes.
- Preparation of reports.

An automated encumbrance search is currently being developed and is intended to be in operation by the end of 2004. In addition an electronic interface with Bhoomi is being developed for the sending of J-slips.

2.3.3 Survey and Settlement Records

Digitisation of Village Maps. In 1999 a pilot project was commenced to digitise the survey and settlement parcel data in two Taluks, Malavalli Taluk in Mandya District and Bail Hongal Taluk in Belgaum District. The approach adopted was to hire a private company at a cost of Rs 72 lakh to capture the field survey information in the settlement survey tippan (field book). The survey information was used to produce individual parcel maps in CAD format with the ultimate objective of mosaicing the parcels to form CAD village maps derived from the field records. The pilot faced a number of difficulties. Firstly, the private contractor had a computer science background and had limited domain knowledge in survey/mapping. Secondly, SSLRD did not closely supervise the work of the contractor and significant effort was required by both the Department and the contractor to validate and correct data entry – the department had up to 60 staff assigned to data validation for about 3 years. Lastly, the CAD parcel maps were never compiled into village maps. With the survey methodology adopted in the original settlement surveys there will never be an exact match between the coordinates determined from the individual parcel surveys and

between the individual parcels and the surveyed village boundaries. There will always be small discrepancies (usually of the order of a metre). A satisfactory methodology to resolve these discrepancies was never developed and implemented.[16] The pilot took 2-3 years, longer than anticipated, took more effort in data validation than was anticipated and did not result in digital village maps.

More recently, a private company from Andhra Pradesh, Spatial Technologies (India) Ltd, has developed software to enter and save individual parcel field data from the tippan (field book) and then to mosaic ("rubber-sheet") the parcel data into digital village and Taluk maps with a semi-automatic process that requires significant manual input. Although there is an option to geo-reference these maps, usable maps can be produced without geo-referencing although this limits the usefulness of the data as a framework for the integration of other digital data.[17] Some pilot work has been undertaken in Karnataka and a proposal made to scale up the activity to cover the whole state in a limited time frame (less than a year) using contract staff working on a three shift/day basis. The estimated cost of this work is about Rs 30 crore for the whole state without geo-referencing (based on an estimate of about Rs 30 per tippan sketch).

Bhoomi has vectorised scanned village maps on a pilot basis and estimates that this work could be completed for the whole State at a cost of Rs 2-3 crore without geo-referencing and could be completed in 1-2 years.

Remote Sensing. The Karnataka State Remote Sensing Applications Centre (KSRSAC) is currently scanning all village maps in a raster form that can be used to produce vector map data. This map product is not based on the tippan record, but based on the existing village maps, which have been prepared predominantly at a scale of 1/7,920 from the tippan records using non-standard manual drafting techniques. The village maps are often decades old and lack the information on subsequent parcel sub-divisions and consolidations. About 3,000 village maps have been scanned and it is anticipated that the remaining maps (about 27,300 villages) be scanned over the next 8 months. There have been discussions between SSLRD and KSRSAC about arrangements and funding for the work after the initial scanning, but no agreement has been reached. The costs being sought by KSRSAC are about Rs 8 crore.

KSRSAC has prepared a number of proposals to vectorise and geo-reference the scanned village map data. They have submitted a proposal to the Secretary of E-

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[16] One methodology that could have been adopted was: (i) input the chainage and offset data from the tippan – the 'fish-bone structure' – (ii) adopt a labelling system for points on each tippan; (iii) input the topology of the joining points in the network of individual 'fish-bones'; and (iv) adopt a semi-automatic process of mosaicing the 'fish-bones' together, modelling the random and systematic errors in the chainage and offset measurements. Points that do not meet pre-set tolerances could be flagged for further investigation. This was not possible in this case as the contractor used the tippan data to directly form parcel polygons into a CAD system and did not preserve the chainage and offset structure of the tippan record. Had the tippan structure been preserved then not only could the parcels be mosaiced, but new parcel measurements from phodi could readily be added to the mosaic and, with additional control points, the mosaiced data could readily and reliably be adjusted to the national geodetic network. The preservation of the survey data in the tippan would also have been a numerical back-up of the tippan.

[17] This possess at least preserves the 'fish-bone' structure of the field observations but the mosaicing could be improved by developing a process to use the topology of the field measurements, as set out in footnote 16.

Governance to undertake a pilot in Mysore district using Quickbird satellite imagery (resolution 0.6 metre) that has been geo-referenced with DGPS control. This proposal was costed at about Rs 4 crore (about 25% for imagery and 12.5% for capital equipment). They have prepared a proposal to the Indian Space Research Organisation (ISRO) to geo-reference the whole state of Karnataka with new Quickbird imagery. This proposal has been costed at about Rs 100 crore (including about Rs 30 crore for satellite imagery, which may be reduced in negotiations for a bulk order). They have also prepared a proposal to the ISRO to geo-reference the whole state of Karnataka using existing LISS III panchromatic-sharpened imagery (resolution 5.8 metres). This proposal has been costed at about Rs 11.8 crore.

KSRSAC has been very active in recent years and has developed a number of fundamental datasets which have been geo-referenced, including a dataset of village boundaries for the whole state.

Settlement Surveys with New Technology (33 Villages). Between about 1974 and 1995 SSLRD undertook a re-survey of 270 of the 298 villages in Taluk Somvarpat in Coorg District. This work was undertaken with theodolites and plane tables in very difficult terrain. The major difficulties experienced on this activity lead to the current pilot in Maddur using new technology.[18] About 2 years ago SSLRD started a pilot settlement survey project in Maddur Taluk in Mandya District involving detailed investigations of rights on the ground, the placement of boundary stones and the measurement of village boundaries and corner stones with total stations. It is planned that these surveys be connected to the national grid (geo-referenced) using control provided by the training institute for the Survey of India, which is based in Hyderabad. This pilot covers 33 villages (there are about 180 villages in Maddur Taluk) comprising about 10,000 existing survey numbers (parcels). SSLRD has 18 total-stations deployed and with support from a private supplier of ERDAS software in Hyderabad has developed specialised software to record the ground observations, parcel definitions and produce the parcel and map records. The survey work for 5 villages has been completed and publicly displayed. Survey work is complete in another 11 villages. It is planned that the remaining 17 villages be completed in the next 6 to 8 months (by about March 2005). The re-survey has involved significant interaction with the community and has resulted in a consolidation of holdings. In the work to date, about 2,040 survey numbers (parcels) have been consolidated into 1,041 parcels, about 400 disputes arose and were resolved during the process, and a significant number of court cases have been withdrawn.[19] These are clear benefits of undertaking a comprehensive adjudication process in a village, but these benefits need to be weighted against the costs involved. There is however some question about the legal status of the re-survey. The re-survey will become effective only when ratified by the government. There is some doubt that this will happen. The

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[18] Burns and Despande (2001) reported that *'However, after 21 years effort and 150-160 million Rs, this pilot* [in Coorg] *was stopped in 1995. The fact that Coorg district is heavily forested, and mountainous contributed to the difficulties of the pilot. There are plans to commence a re-survey pilot in one Taluk in Mandya district this year using total stations and new techniques. A budget of 10 million Rs has been allocated, 50% provided by each of GOI and the Government Karnataka. The new pilot area is easier terrain – a flat, dry plain – and well suited to the use of total stations.'*

[19] This reported level of consolidation is difficult to accept at face value given the fact that in 1991 Karnataka repealed the Consolidation of Land Holdings Act of 1966 (see discussion in Hanstad et al (2004), page 166).

process of updating the RTC records in Bhoomi if the re-survey is ratified is also yet to be specified and agreed.

The work in Maddur, which has been implemented over the past 2 years, is a pilot, with significant effort having been devoted to staff training and the development of new methodology. It is therefore difficult to use the effort to date as a guide in estimating the level of effort required to scale up the effort to complete new settlement surveys over the whole state. A "back-of-the envelope" estimate for the level of effort to complete the approximate 30,300 remaining villages in Karnataka, based on the anticipated 8 months required to complete the remaining 17 villages in Maddur with 18 total-stations, is 257,000 total-station months. Based on the current skill levels in SSLRD and historical funding support for SSLRD, it is reasonable to assume that any new purchase of total-stations for the SSLRD by the state might be limited to about 100 units (at a total initial cost of about Rs 10 crore, with a conservative useful life of about 5-10 years). If all 100 total stations were deployed 12 months a year, it would take 214 years to complete 257,000 total-station months of work. The work will also be costly. The cost of the first registration (settlement survey) varies throughout the world, depending on factors such as relative costs, legal and technology approach and extent of community consultation. A recent study[20] of countries that had recent experience with first registration programs found that the cost/parcel ranged from about US$10/parcel in Moldova to about US$20-30/parcel in Indonesia and Thailand and US$60/parcel in Perú.[21] India has low labour costs but the methodology proposed by SSLRD with full total-station surveys and emplacement of village and parcel boundary stones, is a "Rolls-Royce" approach. If a low unit cost of US$10/parcel is adopted, the total cost to complete the estimated 20 million rural parcels with new settlement surveys is conservatively estimated at about US$200 million (about Rs 900 crore) and is likely to be significantly higher. Clearly it will be difficult gain political commitment for this timeframe and budget. Alternative approaches will have to be explored. These approaches include the partial completion of new settlement surveys, perhaps restricting re-survey activity to areas where records have been lost or where there is a high level of disputes, together with the use of a mix of lower accuracy and lower cost methodology[22] and the involvement of the private sector.

One area of concern is that, despite extensive pilot re-survey activity in both Coorg and Mandya and significant investment in new technology in Mandya, SSLRD would seem not to have been able to demonstrate a production re-survey process[23] that can be scaled up. This difficulty is partially explained by the service rather than production orientation of SSLRD staff. This orientation is reinforced by the apparent

[20] Comparative Study of Land Administration Systems, prepared for the World Bank and available on www.landequity.com.au/recentpubs.htm

[21] The first registration activity in all these countries was undertaken in a mass, systematic process. In countries such as Trinidad & Tobago and Latvia, where a sporadic approach was adopted, the cost per parcel was in excess of US$1,000/parcel.

[22] Options for lower cost methodologies include the graphical techniques of optical square surveys from minor control traverses and the use of differentially rectified photomaps as a survey/map base, and digital options include the use of hand-held DGPS receivers.

[23] A production process is a process that has well-known and defined input and output specifications.

lack of reward systems for staff working on the production activity.[24] Two immediate steps could be taken to address this issue:

- An investigation should be made into providing field allowances to staff (with these allowances preferably based on an output and not a daily basis); and
- SSLRD should be instructed to treat the remaining 17 villages as a chance to prove a production capability. At the completion of the 17 villages SSLRD should be able to define both the type and cost of inputs required for re-survey (recognising that some costs will be per village and some per parcel) and the standard output (in terms of parcels/month/field team and parcels/month/total number of staff).

Microfilming of Records. In 1994 SSLRD commenced the microfilming of the field records for the settlement surveys in Karnataka using two microfilm cameras in the SSLRD office in Bangalore. This activity involves the scanning of the original tippan, pakka (computation) book and the prapthi (assessment book). The hissa and phodi records and the akarband are not being imaged. This task is not a simple imaging exercise. Given the age and condition of many books, significant effort is often required to prepare the material for imaging. SSLRD has completed the microfilming of the field records for about 3,000 villages, or about 2 million of the estimated 200 million images estimated necessary. At this rate the task will never be completed. In any case, a review is necessary as the microfilm cameras are no longer supported by the manufacturer. Given the age and fragile nature of many of the field records and the fundamental role that these records have in defining the extent of rural land holdings, the delay in archiving the settlement field records is a major risk to the veracity of the RTC system.

SSLRD submitted a proposal to Government of India (GOI) to scan and micro-film the remaining tippan records (about 268 Taluks). This proposal was costed at Rs 16.5 crore. Last year GOI approved Rs 1 crore for this activity over 2 years. An initial allocation of Rs 50 lakh has been provided this year to complete the work in 8 Taluks. SSLRD is planning to have this activity outsourced to the private sector and completed by March 2005.

2.3.4 Urban Mapping

City Survey Maps. As previously stated, city survey maps have only been prepared for 48 cities. Even then, these city survey plans only cover part of the cities. The city survey maps have been prepared from about 1965 based on plane table plans

[24] This problem is common on many large first registration ("settlement survey") programs. First registration is very much a production activity, which contrasts with standard land administration activity which is a service process where staff wait and respond to requests for service from the public. First registration is a difficult process, usually involving hard work and intense interaction with the community for long periods of time (in Thailand some staff have spent 9 months a year in the field for well over 10 years). There can also be increased responsibility and personal liability as a result of first registration activity. Standard land administration work on the other hand is usually much less demanding. It can thus be very difficult to foster a production orientation in project staff if there is no financial recognition of the extra demands of the activity. At the very least there should be a field allowance, but often this alone is inadequate. What needs to be rewarded is not time in the field but output. In some of the more successful projects, allowances have been restructured on a production basis (Indonesia) or there is a sliding scale of allowances, with the allowance increasing as output increases (Cambodia).

prepared at a scale of 1/500. The city survey maps are at a scale of 1/2,500. No new maps have been prepared in recent years.

A budget of about Rs 25 lakh has recently been allocated to SSLRD by the Department of Municipal Administration (DMA) to undertake total-station surveys of about 42 square kilometres of the urban area of Tumkur Taluk as part of the DMA project to create fiscal cadastres for the 57 major urban centres outside of Bangalore. As soon as funds are made available, SSLRD plans to deploy 8 total-station field teams. It is anticipated that it will take 18 months to survey the estimated 50,000 urban land parcels (equivalent to about 13 parcels/total-station/day, which is a high average daily rate if the process involves substantial investigation and adjudication of rights, but a low rate if the process only involves measurement).

Town Planning Maps and Layouts. There are two main acts concerned with town planning, the Town and Country Planning Act (1961) and the Karnataka Urban Development Authority Act. A three tier planning process is specified: (i) Outline Development Plans (ODP); (ii) Comprehensive Development Plans (CDP); and (iii) Town Planning Schemes (TPS). ODPs and CDPs have been developed in 97 urban areas. No TPSs have been prepared as yet. There are 28 Urban Development Authorities with a mandate for both planning and development. The most active is the Bangalore Development Authority (BDA). In Karnataka there are about 27 Acts and about 17 departments concerned with land management. There are 23 Planning Authorities responsible only for planning and 46 Municipal Development Authorities. There is overlap in responsibility and duplication in activity. Take Bangalore as an example. There is a Bangalore Metropolitan Region Development Authority that administers the Bangalore Metropolitan Region (BMR), which covers 12 Taluks and is about 8,600 km^2 in extent. Within this region there is the Bangalore Development Authority which covers the Bangalore Mahanagara Palike (BMP) and the surrounding 7 municipalities and 1 town, a total area of about 630 km^2. Within the BDA there is the BMP which covers about 206 km^2. Between the BDA and BMR there is the Bangalore Metropolitan Area, which is administered by the BDA and covers about 500 villages and about 1,357 km^2 (the difference between the BDA and BMA is largely what is supposed to be the green-belt, but in practice is now part of the greater Bangalore metropolis).

The Urban Development Authorities and the Municipal Development Authorities prepare urban layout plans for their own development activity and are responsible for approving layout plans prepared by the private sector. However compliance with the planning regulations is not universal. It is estimated that about 40 percent of the layouts in UDA areas, 45-50 percent of layouts in MDA areas, and 15-25 percent of layouts in other areas are submitted for approval. BDA has prepared layouts for a significant area of greater Bangalore and has copies of many layouts prepared by others. DMA, in its project to prepare tax maps in the 57 major centres outside Bangalore, has not been able to obtain copies of layout plans.

The lack of large scale, up-to-date topographic mapping in urban areas is a problem being addressed by the Town Planning Department. Under the ADB-funded Karnataka Urban Development and Coastal Environmental Management Project, new large scale maps will be prepared from photography flown over 20 major urban areas. Aerial photography has been completed for 13 centres, control is being provided by the Survey of India (SI) and mapping will be undertaken by the National Remote Sensing Agency (NRSA, part of ISRO), with mapping also being undertaken

by KSRSAC if it is successful in obtaining funding for photogrammetric work-stations. Line maps at scales of 1/500 and 1/2,000 will be produced. Maps for Bangalore and Mysore have been completed. The Town Planning Department is talking to the World Bank team preparing the Karnataka Municipal Reform Project about funding the mapping of the other 202 major urban centres in Karnataka (at an estimated cost US$2.5 million over 5 years).

Bangalore Development Authority. Traditionally mapping in Karnataka has been undertaken without coordination. There has been duplication of effort. Late in the 1990s a group of agencies agreed to jointly fund the creation of new large scale topographic mapping over Bangalore – the Reference Mapping – which was to serve as the common map base for the agencies. Aerial photography was flown in 1998 and mapping was arranged through NRSA. NRSA sub-contracted a lot of the work, which was not completed until 2003. The reference mapping was to provide map coverages at scales of 1/2,000, 1/5,000 and 1/10,000, but only the 1/2,000 scale coverage has been delivered. This data is being used by a number of agencies, including BDA, BMP and the Town Planning Department (TPD). A major user has been the French-funded Metropolitan Spatial Data Infrastructure Project (MSDIP). The MSDIP has had considerable difficulty in integrating the NRSA data into a GIS format. MSDIP commissioned Survey of India (SI) to coordinate 900 GPS control points in the greater Bangalore area. This control was used to ortho-rectify SPOT 5 imagery (5 metre resolution). MSDIP had to filter out about 200 of the 900 GPS control points provided by SI as the data did not fit the adjustment.[25] The NRSA map data was referenced to this data with considerable difficulty. Non-systematic shifts of up to 40 metres were evident in the data (where the map accuracy should be 0.1-0.2 metres).[26] Other problems included inconsistent layering of data, poor or missing edge matching, and blocks of buildings shown as single large polygons rather than individual buildings. A more fundamental difficulty was the fact that the maps were provided in CAD rather than GIS format. MSDIP spent about 9 months cleaning 3 of the 120 layers of data (including buildings and streets) into a GIS format, geo-referenced to the differentially rectified satellite imagery. MSDIP subsequently obtained 2002 Quickbird imagery (0.6 metre resolution) and ortho-rectified this data using the SI control. The NRSA mapping was again referenced to this differentially rectified imagery. The final mapping is estimated to be accurate to about 2-3 metres. The result of this effort is being built into the MSDIP, which is due to be completed in June 2005. The only agency using the MSDIP corrected data is BDA. The other agencies using NRSA mapping are using the data as provided by NRSA. MSDIP has also digitised and geo-referenced with considerable effort over many months the settlement survey information for Bangalore.

MSDIP staff also noted their difficulty in hiring mapping engineers and technicians in Karnataka (digitisers, cartographers and surveyors). The MSDIP experience with mapping data and their difficulties raises a number of concerns. These include:

- Even key agencies responsible for map and satellite imagery in India would seem to have difficulty in providing data to international standards;

[25] Apparently SI had incorrectly processed the GPS observations for these points.

[26] These difficulties were due to a number of factors – poor quality control, lack of clear specifications and the use of limited control.

- The agencies also have difficulty in implementing quality control processes and in meeting timelines;
- The agencies planning to use uncorrected NRSA data (including BMP and TPD) will have data that is not properly geo-referenced.

Municipal Tax Mapping. DMA has recently started a major program to create over a short timeframe tax mapping and updated tax rolls for the estimated 3.5 million properties in the 57 major urban centres outside of Bangalore (including the 7 municipalities and 1 town that surround the City of Bangalore). Drawing on international experience, guidelines and a manual for property numbering has been developed. In each municipality this numbering system has four levels: (i) ward; (ii) block (area surrounded by roads); (iii) street; and (iv) door number. The fulcrum is the 'block', which is unlikely to change. Maps are being prepared by SI, with input by contract staff employed by DMA. The tax maps are being compiled from the best available information, which is usually town plans at a scale of 1/4,000 or 1/5,000. Paper copies of these maps are being scanned by SI, geo-referenced to SI control and vectors created of road centrelines in a CAD system. This base information for the road network is being updated in the office by SI staff using the best available imagery (for the 8 municipalities/town around Bangalore, recent Quickbird satellite imagery and for the rest 1/40,000 scale aerial photography captured between 1990 and 1994). Initial base maps are being produced and sent to the field to capture changes/updates to the road network. These changes and updates are entered by SI into the CAD system. Base maps at scales of 1/1,000 to 1/2,000 are then produced for the field teams collecting the individual parcel dimensions and attribute data. This base mapping exercise is being undertaken within the overriding objective that the initial data capture for the tax map and attribute information be completed by the end of 2004. The methodology is not to standard mapping specifications, but the data is geo-referenced and will provide a framework to plot the cadastral detail and ensure that all parcels are referenced. The short-comings of the mapping approach are appreciated. It is proposed that the map detail be updated with new aerial photography, including the new topographic mapping being undertaken by the Town Planning Department. This mapping will include more than the road, parcel and building detail initially being captured for the tax mapping and will be implemented over the next 5 years. DMA also anticipate that more accurate mapping by ground survey will be necessary at some time in the future and are arranging initial ground surveys in 8 major urban centres, including the work in Tumkur to be undertaken by SSLRD.

A detailed investigation form (forms A, B and C) has been developed to capture textual information about each property. Form A sets out information about the property in the existing municipality Khata. Form B sets out property details gathered in the field (including detailed information on the property, any buildings etc. to support the calculation and collection of property tax). Form C sets out the taped measurements and a digital photograph of the property and is signed by the data collector and the supervising engineer. The boundaries based on the tape measurements will be charted on the base maps provided by SI. These maps will then be sent to SI who will incorporate the parcel information in the CAD maps for each municipality. The attribute information will be input into a software system that has been developed for DMA by the E-Governance foundation of Infosys. Significant validation is planned for the completion of form C and data entry. The property

owners will be provided with extracts from the database and given the opportunity to correct/validate the data over a 15-18 months period.

The cost of the Infosys software, estimated at US$2 million, and long-term, on-going support is being provided to the government at no cost. Hardware for the municipalities is being funded under an ADB project. Staff for the operation of the system in the municipalities have been hired and are being trained and deployed.

A significant number of staff (400-500) has been hired for data capture/entry and it is planned to complete the activity for the 57 municipalities by December 2004. The objective of DMA is to increase property tax receipts by a factor of 5 (the 57 municipalities currently account for about Rs 110 crore of the Rs 129 crore collected by all 222 municipalities).

DMA plans to continue the activity in the remaining municipalities using funds from the proposed World Bank-funded Karnataka Municipality Reform Project.

Bangalore Tax Mapping. The Bangalore Mahanagara Palike (BMP) is responsible for local administration in Bangalore City. BMP has a total area of about 206 km^2 and currently has about 0.55 million property taxpayers spread over 100 Wards. BMP is also seeking to update its tax records and undertake tax mapping. BMP has undertaken pilot work in two Wards, Ward 64 and Ward 72. In Ward 64 (about 1.64 km^2) KSRSAC has undertaken pilot activity. The base maps used are the 1/2,000 scale photogrammetric mapping of Bangalore produced by NRSA. KSRSAC used these base maps to undertake field investigations, collecting tape measurements of properties, property attribute information, and significant other information (15 features, including trees by type, roads, footpaths, drainage, bus-stops etc). BMP has about 5,600 taxpayers in Ward 64, but the KSRSAC field work has identified about 7,200 properties (indicating that in ward 64 about 22% of potential taxpayers are not on the BMP Khata). KSRSAC had two teams of 5 undertaking the field work and completed the work in 3 months. The work could have been completed in 2 months if only property information was being collected.

The 'pilot' work in Ward 72 was undertaken by Genasys, one of the three private companies that BMP has contracted to complete the remaining Wards. BMP has prepared 10 tender packages, with each package covering about 20 km^2. In May 2004 Genasys was given 4 packages covering 31 Wards, including Ward 72. The contract specifies that the work be completed in 4 months. Genasys has delivered Ward 72 as a pilot and has completed the survey work for another 4 to 5 Wards. Magnasoft, another private company, has recently been awarded 4 packages covering 48 Wards. The third private company, ADCC Infotech Ltd, has recently been awarded 2 packages covering the remaining 20 Wards. Both Magnasoft and ADCC Infotech Ltd have 4 months to complete their contract, so the work should be completed by the end of 2004. The NRSA 1/2,000 photogrammetric mapping is being used as base mapping, so the new data will be geo-referenced. The BDA layout plans are being used in compiling the GIS. KSRSAC has been contracted to provide quality control. NRSA is providing specialist advice and developing the spatial and aspatial databases. The spatial database is being developed with ESRI products, including ArcIMS.[27] The aspatial database is being established within the

[27] A major US GIS software vendor, see web page www.esri.com

Oracle environment. NRSA will have the databases completed in the next few months, ready to input the data from the three companies.

The contractors are using a form to gather data from property holders, including details for property and building areas. A digital photograph is taken of each property. Only irregular-shaped parcels are measured by the field teams. The field data form is not signed by the property holder and BMP is not proposing to provide copies of the data entered into the database to property holders for verification. The data gathered in the field will be verified internally against the data held by the BMP Revenue Department. Field inspection will investigate any discrepancies. The data in the BMP Revenue Department is largely based on data from a self-assessment form prepared and signed by property holders. Property holders will have the chance to appeal for corrections to the BMP Khata when given notice of their annual assessment. The BMP data will also be available on the internet and property holders will be able to request that the data be corrected to accord with documents that they hold.

Yadrami Gram Panchayat in Gulbarga District. The Rural Development and Panchayat Department has sponsored a project in Gulbarga District to prepare large scale mapping of non-agriculture property. This project includes mapping of the Gram Tana, the central urban area that was not covered by the settlement survey. A comprehensive natural resource GIS has been prepared of Gulbarga District, based on the Survey of India 1/50,000 scale topographic maps. The pilot has been implemented in Yadrami Gram Panchayat, one of 33 Gram Panchayats in Jewargi Taluk. Yadrami Gram Panchayat has three villages, Yadrami, Yadrami Tanda and Akhandahalli. The Village map has been digitised and geo-referenced with GPS ground control points. Mapping of the three villages has been undertaken by plane-table at a scale of 1/1,000. The plan table maps have been geo-referenced with GPS. The mapping detail includes houses, compounds, drainage etc and a substantial amount of attribute data has been collected. The work was undertaken by a local official with support from a few students at a polytechnic over a period of 2 months, one month to collect the data, including the detail for about 2,000 buildings, and one month to enter the data in a GIS. The cost of the pilot has been about Rs 2 lakh.

Survey of 25 Gram Tana in Tumkur District. Thematics, a private GIS company, has recently mapped using total-stations 25 Gram Tana in 5 Tuluks in Tumkur District for the UNDP-funded Bio-Mass Energy for Rural India project. This work was undertaken for Rs 450/acre. With each Gram Tana having about 100-150 households and being about 7-10 acres in extent, the cost per Gram Tana was in the range of Rs 3,150-4,500. With two survey teams in a Gram Tana, the field work in a Gram Tana was typically completed in three days. This private company is therefore significantly cheaper and faster than the Rural Development pilot in Gulbarga.

2.3.5 Private Surveyors

It is currently estimated that there is a backlog of about 300,000 requests for individual surveys in SSLRD, and perhaps a similar number of potential requests that are currently being held by the Tahsildars. To address this backlog, SSLRD implemented in 2001 a program to license private surveyors and regulated that surveys be undertaken prior to mutation. A call was made for applicants with certificate qualifications in surveying. About 2,500 applications were received and

about 2,000 selected for 3 months training (at a cost to the applicant of Rs 2,000). All subsequently passed the final exam, although some had to sit the exam a second time. Having passed the exam the private surveyors were given a license (for an initial fee of Rs 1,000) which is renewable annually (for a fee of Rs 100). Private surveyors have access to the records by paying the standard fee. Their fees are limited to Rs 300 per survey (the fee for a government survey ranges from Rs 35-50). Private survey plans are lodged in Bangalore and shortly after the introduction of the system there were about 40 to 50 surveys lodged daily. This activity has been put on hold due to a High Court stay while it rules on an appeal by document writers against the system. There is no evidence that private surveyors have had a significant impact on the survey backlog. Staff in the Mandya Taluk office observed that the public did not trust private surveyors.

2.4 Major Short-Comings of Existing Situation

There are many issues relating to land records in Karnataka and even more underlying causes of these issues. These issues and underlying causes overlap. The following seven major issues have been identified in this study and serve as the framework for the options for improvement set out in the next section of this report.

2.4.1 SSLRD Maps

Efficient systems to officially record rights in land comprise two basic sets of information:

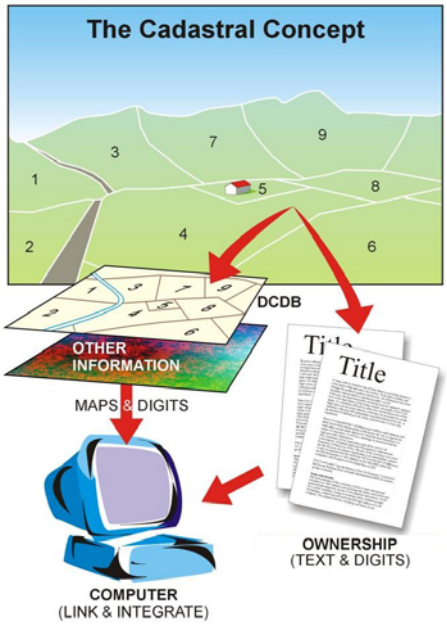
- registers comprised largely of textual or alphanumeric data that record rights in land; and
- maps or a spatial framework that define the boundaries and extent of land parcels over which these rights apply.

These two basic sets of information constitute the concept of the cadastre, which is illustrated in Figure 2. Under the cadastral concept there is a close, explicit linkage between the textual and spatial data. With this link in place, various search/access mechanisms can be developed to search information on rights in land. These searches can be from keys in the alphanumeric data or from queries in the spatial framework and reports can be produced in either or both domains. The spatial framework can also be a useful tool in validating the textual data, identifying, for example, parcels where numerical data is not available. The close linkage between the spatial and textual data is illustrated in Figure 3, as is the use of search mechanisms to facilitate access to information on rights in land by a range of users including lawyers, financiers, local government etc. An essential prerequisite for an efficient cadastral system is therefore ensuring that the two datasets are maintained and up-to-date. No set of rights should exist without a spatial parcel to assign them to, and all spatial parcels should be linked to a set of rights.

Another concept worthy of mention is geo-referencing. If the cadastre is formulated in the national geodetic reference frame then other data sets can be easily and reliably overlaid on the cadastre. These other datasets may include topographic information, census districts, satellite imagery etc. With geo-referencing, the cadastral data has many other potential uses, such as the spatial framework for a GPS navigation system for vehicles. Geo-referenced cadastral data is therefore a fundamental dataset in the creation of the spatial data infrastructure in a jurisdiction.

This is illustrated as the spatial component in Figure 3. However, it is important to note that efficient cadastral systems can be developed without geo-referencing, but these systems often operate as isolated systems due to the difficulty in referencing other datasets.

Figure 2 - Cadastral Concept



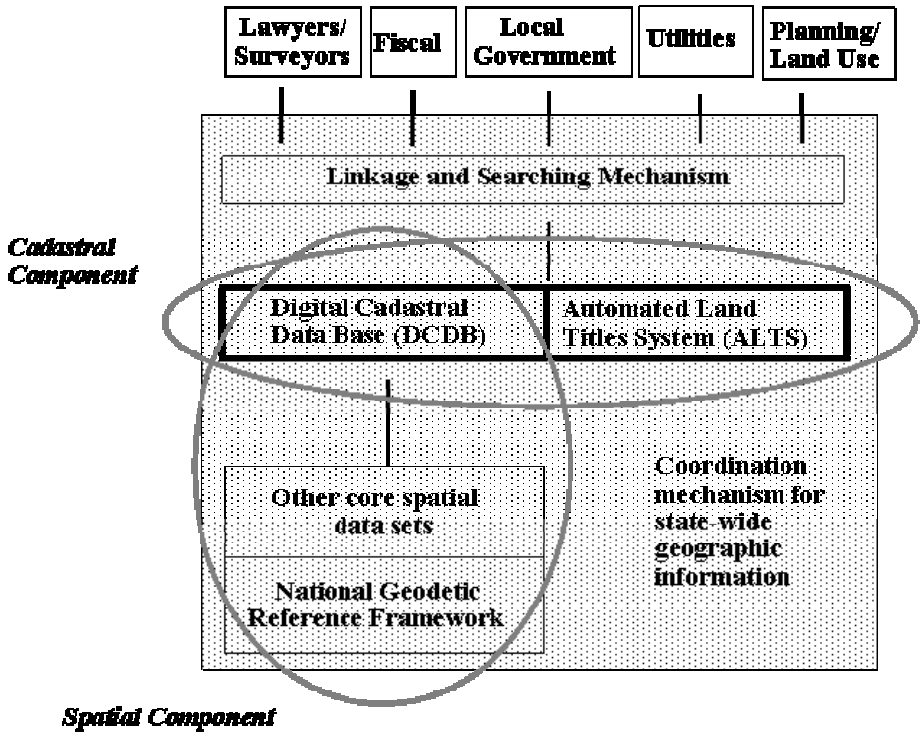
With this introduction, the status of the land records systems will be reviewed. For **agricultural lands** the following major issues arise:

- the British introduced simple and quick methods to measure land holdings. These methods have been continued by SSLRD. The primary record for the settlement surveys is the individual parcel survey records (tippan). There is no mathematically rigorous method to compile a cadastral map from the tippan record;
- the tippan record is fragile and some records have been lost (this issue is picked up below);
- non-standard, manual drafting techniques were used to graphically compile village maps using the information in the tippan books;
- the village maps are updated infrequently (no more frequently than every 10-30 years) and any subdivisions happening in the interim are not charted;
- there are long delays in surveys for sub-divisions – sometimes decades[28] - and mutations are being recorded in the RTC without survey;
- largely due to inheritance, land holdings are increasingly being fragmented. Consolidation can be implemented in re-survey, but few re-surveys have been undertaken. The result is that it is common for a farmer's landholding is recorded on several (many) RTC records;
- the settlement surveys and the village maps are not geo-referenced.

[28] See Burns and Despande, 2001.

These issues create a number of problems. Perhaps the major problem is the lack of a clear, unambiguous spatial reference for the RTC system. The tippan record is the primary spatial reference for the RTC system. The tippan records for less than 10% of the villages in Karnataka have been archived to microfilm. If the tippan record is lost, there will be increased uncertainty over rights, leading to an increased number of disputes and higher costs by the state and individuals in resolving these disputes. The village maps comprise a spatial framework to validate the RTC records. These maps cannot fulfil this function if they are inaccurate and not up-to-date and in this form the maps cannot be readily accessed by other users. The lack of geo-referencing also limits the usefulness of the maps as a core reference for integration with other datasets such as topographic maps, demographic information and satellite data. Karnataka, with computerised RTC records in Bhoomi, and a strengthened spatial framework based on the tippan/village map records, has the basis for a title registration system. Without the spatial framework, Karnataka will need to explore other more costly and time-consuming options, such as re-survey, to be able to establish a title registration system.

Figure 3 - Spatial Data Infrastructure (from Williamson).



Many of the same issues apply to **urban areas**, particularly the infrequent updating of maps and the lack of geo-referencing but the following additional issues apply:

- SSLRD has only been able to produce City Survey maps in 48 urban centres, and even so, City Survey maps only cover part of these urban centres;
- Reference to survey numbers in the sub-registries in urban areas is not the norm, even in areas where City Survey plans exist. The prime reference seems to be street address and municipality Khata;

- Few mutations are being recorded in the Property Cards.

It is therefore not surprising that the Administrative Reform Commission has recently recommended that the City Survey be discontinued and the staff reassigned to other tasks in SSLRD. This is not the answer, but something needs to be done.

2.4.2 Urban and non-agricultural land

As noted earlier, there is a lack of both map and textual information in urban areas. The SSLRD City Survey Plans and associated Property Cards only cover parts of 48 urban centres. This information is not up-to-date and does not reflect the reality on the ground. The municipal property tax registers (Khata) do not have a spatial component and are incomplete. There are no large-scale, up-to-date maps of urban areas, both for the major urban centres and for non-agriculture land in rural areas. There is therefore currently no information base on which to populate a system like Bhoomi to record rights for urban and non-agriculture land. This is changing quickly with the current efforts by DMA and BMP to generate tax mapping and update tax rolls in an accelerated manner.

2.4.3 Land Valuation

The land administration system in India was originally set up to raise revenue from land. Valuation thus formed an essential element in the settlement surveys conducted under the British administration, and this continues today. The Karnataka Stamp (Prevention of Undervaluation of Instruments) Rules of 1977 sets out the principles for the determination of market value for land, house sites, buildings and other lands.[29] For rural land a factor considered is the revenue assessment established during the settlement surveys, which is supposed to be updated every 30 years.[30]

A primary reference has traditionally been the sales histories recorded by the Sub-Registries, although this information has a number of distortions and there is often limited sales information in rural areas. The area covered by the Sub-Registry is grouped into areas of like characteristics and a roll of market values – in Rs/square foot in non-agricultural areas and Rs/Acre in rural areas – is prepared and published in the Karnataka Gazette. A period, normally 30 days after publication, is allowed for the submission of objections. These objections are considered and the valuation roll is approved by the Government and published in the Gazette. Local publishers print copies of the valuation roll and this information is available from local bookstores.

A key element in KAVERI is the determination by the software of the assessed value of each property. The applicant for registration has the option to adopt this assessed value for the purposes of payment of fees and taxes. As the assessed value is usually significantly less than the market value most accept the assessed value. KAVERI thus significantly reduces problems such as collusion between officials and applicants on low assessed values and the payment informal fees. The recent

[29] Section 5.

[30] The period of 30 years for the revenue rates was guaranteed under the original settlement (Jayaram, 2000, page XI). Obviously over the 30-year period the revenue rate would erode in value and become less relevant in assessing current values.

reduction in stamp and registration fees also reduces incentives to under-declare property values.

Local authorities (panchayat) also undertake a rating of property to support panchayat tax assessment. This assessment is usually undertaken on a community basis, with a ranking of all taxable lands in the jurisdiction and is based on an assessment of annual rentals for all rateable property. This information is revised every 5 years. In Bangalore the local corporation has recently adopted a policy of self-assessment of property assessments, knowing that the published market values are freely available.

As Jayaram (2000) notes, the published market values determined by the various levels of government do not reflect up-to-date market values, but provide some measure of the relative value of property. Jayaram notes three characteristics with the published market values:

- The assessed values tend to remain fixed for some time
- Any change that does occur is likely to be a change downwards, with some properties being reduced more than others[31]
- There is a tendency in an area for an excessive concentration about a mean value.

The system for the valuation of rural land in Karnataka is very rudimentary. The information collected by Government does provide some measure of relative values, but will lead to difficulties is establishing value where private property is being compulsorily acquired by the State under the Land Acquisition Act.

2.4.4 Original survey records

The original field book (tippan) record for the settlement surveys is the prime reference for defining the boundaries and dimensions of agricultural land. As previously noted, the survey methodology adopted by the British and carried on by SSLRD is quick and relatively low in accuracy. No redundant observations were taken (for example, no measurements were taken of the distances on parcel boundaries) and many tippans have been recorded in an old script that can be difficult to read or interpret. Finally, many of the field records are very old and in a fragile state. The effort in micro-filming the field records over the past decade has demonstrated that often much work is required to get the field records in a form that can be imaged or scanned. The SSLRD program to microfilm the field records will never be completed under the present arrangements. GOI has recently allocated funding to the scanning of the field records.

2.4.5 Registration system

Under the Indian law, registration is necessary to give effect to a legally valid deed, which provides the incentive for registration. The Registration system is intended to place on public record transactions with land in all areas but it is not a complete land

[31] Jayaram (2000) notes that the least line of resistance for tax assessors seems to be to reduce the assessed values of few properties, particularly for property owners who appeal or agitate, and leave most property values unchanged. Over time, this has the effect of depressing overall assessed values below general market values.

record as it does not apply to certain matters affecting land ownership such as inheritance, transfers by operation of law, Court decrees, etc., although some of these matters may be recorded in the record of rights.

By law the registration of a transaction is compulsory (except in the case of the matters referred to above). Registration does not include the adjudication of rights and the resolution of disputes and does not ensure the validity of a transaction. Registration serves only to provide evidentiary value of a document in a court of law and, in the case of compulsory registration, registered instruments have priority over unregistered ones. It is the duty of the purchaser to investigate the ownership claims of the seller. An encumbrance search is necessary to establish whether the seller has a good title. This is normally a search of all transactions over the previous 15 years. If the search is clear, the Sub-Registrar would issue a non-encumbrance certificate of property. As the mere act of registration does not create or establish title to a property, it is possible that not all transactions are registered. There is anecdotal evidence that many transactions are not registered. Stamps and Registration is a tax that lends itself to a number of abuses and malpractices not just in valuation of properties but also in ingenious methods and instruments devised for conveyance of properties.

The Sub-Registrars are supposed to inform the Tahsildar in the case of agricultural land and the city survey office in the case of properties under City Survey, of all registered transactions, so that necessary changes in records may be made. In the past, this information has been either not sent, or sent late, or not acted upon, with the result that necessary correction of records often does not take place. Mostly it is left to the buyer of property to ensure that his name is recorded in the revenue records. The buyer spends a lot of his time and money in chasing papers to get the process completed.

The Registration office looks after document registration only. There are no cadastral maps kept in the sub-registries. Furthermore, the description of the land contained in a deed may leave a lot to be desired in terms of providing an accurate location of the property, particularly in urban areas. The model deeds provided by Registration and Stamps Department require both a metes and bounds description and reference to survey number, Khata number or street address. However, inspections of registered deeds in urban areas disclosed that descriptions are vague and imprecise. Thus the system is one which goes to a lot of trouble to ensure the correct identification of the parties to a deed, but does little to facilitate the location of the land the subject of a deed or to ensure the correct identification of the land.

2.4.6 Record of Rights

Section 133 of the Karnataka Land Revenue Act states that “an entry in the Record of Rights and a certified entry in the Register of Mutations shall be presumed to be true until the contrary is proved or a new entry is lawfully substituted therefore”. It has been stated that “As regards Indian law as to title to land, the statute law of India as in force at present, broadly speaking, does not profess to provide for a state certification of title to land under the aegis of a public authority. No doubt, regarding agricultural land, the record-of-rights in land and similar documents, by virtue of provisions in the land laws of various states, create a structure, at least in theory, of permanent records of transactions concerning such land. But the entries in such records are not conclusive even though they may be relevant in a court of law and

may be given presumptive status by land laws" (Wadhwa, 1989). The Supreme Court of India has held that: "It is firmly established that the revenue records are not documents of title…".[32]

Serious consideration needs to be given to the future role and status of this record. The main questions are dealt with under the following paragraph on Bhoomi.

2.4.7 Bhoomi

Bhoomi has made major improvements in the Land Revenue Act system. It has met a pressing need for improved service delivery in this area and been widely acclaimed, although there have been some criticisms. The most common criticisms relate to the travel necessary to access the system at Taluk level and the quality of the data in the system. The first matter should be overcome by the planned opening of kiosks at village level, while the greater openness and transparency, together with the facility for quick correction of errors should progressively overcome the latter problem.

Notwithstanding the improvements, Bhoomi is essentially a computerisation of a very old land revenue system. In an ideal situation it would have been desirable to review and re-engineer the basic land administration systems prior to computerisation, but this would have delayed the much needed service delivery improvements. However, the opportunity should now be taken to undertake this task and ensure that Bhoomi, or any redevelopment of it meets the future needs of a modern society. The issues that need to be addressed are similar to those facing the Record of Rights generally as mentioned in the previous paragraph. They are:

- the appropriateness of existing Land Revenue procedures followed in Bhoomi. For example, the process of handling mutations is very cumbersome.
- the data that the system should hold. Should it continue to hold all the existing data, is that data necessary and, if so is Bhoomi the place to hold it? Does the revenue collected from agricultural land justify continuing the maintenance of the existing system and the information contained in it?
- the extent of the system. Should Bhoomi be an information system for all land in the State?
- the status of the information in the system. Should all or some of the information be regarded as conclusive in the eyes of the law and possibly have the status of information guaranteed by the State?

2.4.8 Fragmented Land Records Systems and Multiple Agencies

Currently, the Survey, Settlements and Land Records Department prepares and maintains survey and mapping records and property cards, the Revenue Department prepares and maintains the record of rights and the Department of Registration and Stamps registers and maintains records on transactions with land. None of these systems is complete or comprehensive or definitive. The record of rights is now only relevant to agricultural land. In the case of urban land the Survey, Settlements and Land Records Department maintains property cards for urban areas for which city

[32] *Corporation of the City of Bangalore v M Papaiah and Another,* Judgments Today, 1989 (3) SC 294, at 296.

survey maps exist, but these maps only cover a limited proportion of urban areas. Outside of these areas the main property record is the Khata kept by the relevant Corporation/Municipal/Panchayat office but this is only a record of taxpayers and does not profess to represent ownership. The Registration system is intended to place on public record transactions with land in all areas but does not apply to certain matters affecting land ownership such as inheritance, transfers by operation of law, Court decrees, etc., although these matters can be recorded in the record of rights.

The co-existence of the Revenue and Registration record systems results in duplication of effort and additional and unnecessary costs and complications. A transaction with land which is required to be registered under the Registration Act, 1908 must also be recorded in the RTC in the case of agricultural land and in the property cards in the case of land for which a city survey plan exists. But certain transactions may be entered in the RTC and not in the Registration record. Any person interested in entering into a transaction with such land must conduct searches in both locations as well as elsewhere. This combination of systems is inefficient to operate and maintain and complex to use.

In the case of urban and non-agricultural land, after registration of a transaction resulting in change of ownership, it is necessary for the owner to make application to the Corporation/Municipal/Panchayat office, together with a copy of the deed in order to update the Khata. As a result Khata records are not always complete and up-to-date. The overall result is that there is considerable uncertainty in rights and government records have limited effect in clearing up this uncertainty. This is illustrated in the two cases in the following text box.

'My father had bought a site of about 4.5 cents (28 in front and 27.5 behind). But the registration was done only for 27.5 in front and 27 behind. The difference of one foot was not registered by oversight. My father did not treat this as a major issue as both sides of our property were fenced. This one foot is occupied by us since 1982. Two years ago my father built a house. Now the neighbour on the left side of our house came to know of the difference and is trying to claim it as his. Please advise a course of action. ***Hemalatha A***

Firstly, find out the area which your father is entitled to. This you can find out if he has purchased by taking the sale of your neighbour if he gives or otherwise you can take a certified copy from the sub-registrar's office concerned. You should also check the title of your father's seller to find out whether he had the area as stated by you being 28 feet in front and 27.5 behind. On ascertaining the facts you can then file a suit to restrain any interference in your occupation of the area in your possession since 1982.'

'My mother owns a house purchased in 1990. It comes under the Corporation limits. Recently, she signed an agreement with a prospective purchaser and also received an advance amount. A problem has now arisen. There has been an error in the schedule of the house mentioned in the sale deed. The purchaser has requested us to get the error rectified in the sale deed. What is the procedure to get the sale deed rectified? Is the previous owner i.e. the person who sold the house to my mother required? We have approached him for his co-operation but he is demanding a huge amount. What is the solution? ***Surendra Kapadia***

First, ascertain the nature of the rectification required. If it is not very critical, e.g. if there is an error only in one of the boundaries and if the earlier owner is not co-operating with you, you can proceed with the transaction and correct the error in the present sale deed with the confirmation of the boundary by your neighbour. If the error is one requiring rectification and the owner is refusing you would have to take action to get the same rectified in court.'

Source: Legal Eagle Column in the Property Section of Bangalore Times, 10 September 2004. Columnist Anup Shah, Advocate.

2.5 Options for Improvement

2.5.1 Spatial Framework

There are four main sub-components of the spatial framework that supports the recording of rights in Karnataka. These sub-components are:

- the spatial framework that supports Bhoomi (the settlement survey);
- the spatial framework that supports registering rights in Bangalore;
- the spatial framework that supports registering rights in cities and municipalities other than Bangalore;
- the spatial framework that supports registering rights over non-agricultural land administered by the Gram Panchayat.

The strategic options for each of these four sub-components are discussed below.

Spatial Framework for Bhoomi. The spatial framework that supports Bhoomi is the settlement survey data, supported by records of subsequent phodi. As previously noted, there is a number of problems with this system and the manner in which it supports the RTC system. There is also a number of initiatives that that can strengthen this system, most of which have been investigated. These options range from the scanning of the existing village maps and modifying Bhoomi and KAVERI to reference this data as noting charts, to full re-settlement surveys. There are many options between. The characteristics of the some of the major options are summarised in the table below.

Table 2 - Strategic Options to Strengthen the Spatial Framework for Bhoomi.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.1 Secure archiving of the settlement survey field books.	Rs 10 crore 2 years +	1. Already funded by GOI 2. Essential if the tippan is to continue to be the main spatial reference for the RTC	1. Many of the field records have degraded to the extent that they are difficult to scan.
1.2 Scanning of the existing village maps and modifying Bhoomi and KAVERI software to use the raster data as a spatial reference/charting tool.	Rs 0.2-1 crore < 1 year	1. The village maps are currently being scanned. 2. Low cost 3. Village maps are a prime spatial reference in the present system.	1. Deficiencies in village maps (non-standard, infrequently updated, phodi not charted, etc). 2. Village maps are not geo-referenced. 3. Limited query on raster data.
1.3 Vectorising scanned village maps, updated for hissa and phodi (but not geo-referenced).	Rs 2-5 crore 2 years	1. Low cost 2. Village maps are a prime spatial reference in the present system. 3. Data in vector form – facilitates queries.	1. Deficiencies in village maps (non-standard, infrequently updated, phodi not charted, etc). 2. Not geo-referenced (but can be with GPS observations).
1.4 Vectorising scanned village maps and geo-referencing to LISS III, pan-sharpened imagery.	Rs 12 crore 2 years	1. Cadastre geo-referenced (~10 metres) 2. Relatively low cost 3. Village maps are a prime spatial reference in the present system. 4. Data in vector form – facilitates queries.	1. Deficiencies in village maps (non-standard, infrequently updated, phodi not charted, etc). 2. Geo-reference only to ~10 metres
1.5 Vectorising scanned village maps and geo-referencing to new Quickbird imagery.	Rs 100 crore ~6 years	1. Cadastre geo-referenced (~1-2 metres) 2. Village maps are a prime spatial reference in the present system. 4. Data in vector form – facilitates queries.	1. Deficiencies in village maps (non-standard, infrequently updated, phodi not charted, etc). 2. Relatively high cost, and long duration.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.6 Inputting data from tippan, developing algorithms to generate topology, option of geo-referencing.	Rs 30 crore (without geo-referencing) 1 year +	1. Tippan observations archived 2. Maps highest accuracy possible from settlement surveys 3. Digital data – facilitates mosaicing, phodi update, option for geo-referencing. 4. Data in vector form – facilitates queries.	1. Tippan does not show all changes in boundaries 2. Not geo-referenced – but can be geo-referenced at additional cost. 3. Pushing the original measurements beyond their status. 4. No redundancy in tippan measurements and tippan can be difficult to interpret 5. Status of new area compared to area determined after settlement survey unknown. 6. Need to develop algorithms to generate topology. 7. Need to develop clear guidelines for map generation and version control.
1.7 Full re-settlement survey.	Rs 900 crore ++ 20 years ++	1. Substantial community interaction – resolves disputes. 2. Consolidates holdings, updates mutations/phodi 3. Most accurate determination of boundaries.	1. Needs to be managed carefully or could create social unrest. 2. Process has not been demonstrated in a form that can be scaled-up. 3. Very high cost and long timeframe – difficult to get political support. 4. Needs substantial out-sourcing to reduce cost/timeframe.

The options listed above are not mutually exclusive. Option 1.1 has to be implemented, and needs careful management. Option 1.2 could be implemented as an interim measure, with a strategy to move to another long-term strategy (say, option 1.3 with an option to geo-reference). A partial re-settlement survey (option 1.7, with lower cost survey technology) may be necessary in areas where records have been destroyed or where there is a significant level of disputation over land.

The recommended solution is the archiving of the tippan (option 1.1) and the vectorising and updating of scanned village maps (option 1.3). These village maps will not be geo-referenced, but given the difficulty experienced by MSDIP with data that was supposed to be geo-referenced (see page 21) there would be considerable added complexity in ensuring that any geo-referencing is reliable. The vectorised and updated village maps will provide an appropriate digital map index to the attribute information and the base tippan record.

Spatial Framework for Bangalore. With the lack of information in Bangalore and given the current activity by BMP to generate new tax maps, there are limited options – perhaps only two. The first is to adopt the best available information, the new BMP tax maps. The second is to embark on a major program of ground/settlement surveys. The relative advantages and disadvantages of the two options are set out in the table below.

Table 3 - Strategic Options to Generate a Cadastral Framework in Bangalore.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.11 Adopt the new BMP tax maps as the cadastral framework.	Minimal Early to mid 2005	1. Builds on recent spatial/ attribute data collection by BMP. 2. Spatial data is geo-referenced (based on 1/2,000 mapping) 3. Spatial data is in GIS form. 4. Direct link to BMP parcel IDs and attributes. 5. BMP validation of data – both initially and on-going. 6. All property mapped (including informal settlements). 7. Low cost and quick.	1. Parcel boundaries to map accuracy (0.1-0.2 metres) 2. BMP collecting information on 'taxpayers' not owners.
1.12 Undertake a major program of ground surveys.	Rs 50-200 crore ~5-10 years	1. High accuracy. 2. Substantial interaction with the community	1. Needs to be managed carefully or could create social unrest. 2. Process has not been demonstrated in a form that can be scaled-up. 3. Very high cost and long timeframe – difficult to get political support. 4. Needs substantial out-sourcing to reduce cost/timeframe.

The choice here is pretty clear, although once again the options are not mutually exclusive. A partial ground/settlement survey, perhaps with lower cost survey technology, may be necessary in areas where the BMP data is deemed unreliable or where there is a significant level of disputation over land.

Spatial Framework for Municipalities. With the lack of information in the major urban centres outside of Bangalore and given the current activity by DMA to generate new tax maps for the 57 major municipalities, there are again limited options – perhaps only two. The first is to adopt the best available information, the new DMA tax maps. The second is to embark on a major program of ground/settlement surveys. The relative advantages and disadvantages of the two options are set out in the table below.

Table 4 - Strategic Options to Generate a Cadastral Framework for the Municipalities.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.21 Adopt the new DMA tax maps as the cadastral framework.	Minimal Early to mid 2005	1. Builds on recent spatial/ attribute data collection by DMA. 2. Spatial data is geo-referenced (but not to mapping standards, although there is a strategy to improve accuracy over time) 3. Spatial data is in CAD form. 4. Direct link to DMA parcel IDs and attributes. 5. DMA/municipality validation of data – both initially and on-going. 6. All property mapped (including informal settlements). 7. Low cost and quick.	1. Parcel boundaries not very accurate on maps – but no gaps/overlaps and Form C shows taped measurements and could be considered a 'tippan' 2. Need to convert CAD to GIS format 3. DMA collecting information on 'taxpayers' not owners. 4. Initial DMA tax mapping only covering 57 major urban centres (but DMA planning to extend program).

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.22 Undertake a major program of ground surveys.	Rs 100-1,000 crore 20 years+	1. High accuracy. 2. Substantial interaction with the community	1. Needs to be managed carefully or could create social unrest. 2. Process has not been demonstrated in a form that can be scaled-up. 3. Very high cost and long timeframe – difficult to get political support. 4. Needs substantial out-sourcing to reduce cost/timeframe.

Again the choice here is pretty clear, although once again the options are not mutually exclusive. A partial ground/settlement survey, perhaps with lower cost survey technology, may be necessary in areas where the DMA data is deemed unreliable or where there is a significant level of disputation over land. DMA is planning to update the spatial data with new mapping and ground survey on a priority basis.

Spatial Framework for Gram Panchayat. There is not a clear strategy to address the requirements for Gram Panchayat. There are several approaches that could be adopted. There are indications that some Gram Panchayat are prepared to invest in better tax maps and tax rolls. Some of the possible approaches, and their relative advantages and disadvantages are listed below in Table 5. The approach adopted in a particular Gram Panchayat will depend on the situation and circumstances in that village. More investigation is required to refine the various approaches and to assess their relative importance in expanding cadastral maps to the Gram Panchayat. The experience and approach adopted in Gulbarga District has merit, although the experience in Tumkur would indicate that the private sector can do the work significantly cheaper and faster.

Table 5 - Strategic Options to Generate a Cadastral Framework for the Gram Panchayat.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
1.31 Adopt a modified DMA approach (where town planning maps or equivalent base maps are available).	Will involve similar cost to DMA program Application will probably involve piloting	1. Builds on procedures developed and refined by DMA	1. Needs some basic map information. This may not be available in all Gram Panchayats.
1.32 Build spatial framework based on Settlement Surveys, plus data from alienation (conversion) and sub-division/layout approvals.	Will require investigation/piloting	1. Direct link and basis with settlement records and approved development	1. Records may not be available as much development has not been approved
1.33 Implement a program of self-assessment/declaration by property holders, linked to Settlement Survey records	Will require investigation/piloting	1. Quick and low cost 2. Based on reality on the ground 3. Process has precedent in BMP 4. Base data can be used by Panchayat for tax purposes	1. Will only provide provisional information – some additional work will be required to verify self-assessment
1.34 Scale-up the local data capture experience from Gulbarga and Tumkur	Government ~Rs 2.5 lakh/GP ~ 2 months/GP Private ~0.2 lakh/GP ~2 weeks/GP	1. Quick, realistic output 2. Base data can be used by Panchayat for tax purposes 3. Can be used for regularisation of construction.	1. Regularisation can delay the activity. 2. Some GPs lack resources to assist.

In addition to the strategic options listed above for the four sub-components, steps need to be taken to ensure that the spatial framework is maintained. These steps include streamlining the phodi process, clearing the backlog of phodi requests and ensuring that in future phodis are undertaken in a timely manner. The private sector will be important in this task. The registration process should also insist on phodi prior to registration.

2.5.2 Extension of Bhoomi

To facilitate to evolution of Bhoomi into a system that records secure rights in land, Bhoomi should be re-engineered to group data, with a concentration on data types that are directly related to rights in property (see the discussion on page 49). Bhoomi should also be modified to establish a closer link to the spatial framework.

The urban property information being collected by BMP in Bangalore and DMA for the 57 major urban centres outside of Bangalore is being collected to support property tax assessment. These datasets include a lot of information that supports the determination of tax payable (for example building areas and types), but is not directly related to a record of rights in property. The system to record rights in land will also have difficulty in keeping this information up-to-date. In any case, the state is unlikely to guarantee data such as building areas and types at any time in the future. The BMP and DMA data will provide good data to support the extension of Bhoomi into urban areas, however only data items that are directly related to rights in property should be input (with the ability to record apartment area and dimensions as well, or instead of parcel areas). The system should have a direct link to the BMP/DMA property identifier.

A number of issues will need to be addressed in integrating the BMP and DMA data into an 'urban' Bhoomi, including:

- the BMP/DMA attribute data will need a spatial framework and the BMP/DMA spatial data should be transferred with the aspatial data and integrated into an 'urban' Bhoomi (as vectors, not raster images);
- although the processes being adopted by BMP and DMA provide mechanisms for the correction of the BMP/DMA databases by property holders, once the data is transferred into an 'urban' Bhoomi it would seem prudent that property holders be given a copy of the record and be given the opportunity to correct the record;
- there will probably need to be a mechanism to ensure that public land is protected as 'urban' Bhoomi is generated from the BMP/DMA data. This protection is likely to involve a review of existing documents, including the Revenue Department alienation records, and consultations with various concerned agencies prior to the input of the data and public consultations. The BMP/DMA map data will greatly aid in this task;
- the BMP and DMA databases will include information on groups of residents that may not qualify as 'owners' under the current legislation. These groups will include informal settlers. Policies will need to be developed to address the status of these groups. However it would be best that this data be included in

the ‘urban’ Bhoomi, with clear indication of tenure status, as the information will be essential in implementing any policy decisions.[33]

- the status of the information in ‘urban’ Bhoomi. It would be best if the information could be regarded as the property card or record of rights in accordance with the Land Revenue Act Rules. However, this will be dependent on whether the mapping and data collection process by BMP and DMA can be regarded as a survey for the purposes of the Land Revenue Act and Rules – (see analysis set out in Annex 4, page 80).

An ‘urban’ Bhoomi could be developed quickly using the BMP and DMA data. The coverage of the system can then be widened as DMA extends the coverage of the new municipality tax mapping and tax rolls beyond the initial 57 urban centres and as data is generated from the activities with the Gram Panchayat.

Given the reliance on the BMP and DMA databases and given the early stage of the implementation of these two projects, it will be important that close contact be established between Bhoomi and both BMP and DMA. It will be essential that steps are taken to ensure that:

- the contractors gathering the data will collect any information on Revenue Department survey number and or City Survey Number in addition to the BMP Khata number and street address;
- information on tenure status is gathered by BMP and DMA;
- there are processes to protect public land and to clearly mark public land on the tax maps;
- the project progress is closely monitored and reported.

It is suggested that the progress of the BMP and DMA tax mapping projects be monitored monthly by Bhoomi project staff.

2.5.3 Certainty in Rights in Land

The lack of certainty of rights in the present systems has been the subject of much consideration and discussion. For example, in the first report of the Karnataka Tax Reform Commission the advantages of title registration were discussed. It was said that “This eliminates the need for costly, repeated and imperfect retrospective title investigation, removes the possibility of errors in title and frauds and gives State-guaranteed security. Title would then depend on the act of registration and not documents or judicial orders. Such a system requires securely kept, reliable and updated records. This would enormously reduce charges for lending against the security of land, increase the supply of capital for development and eliminate protracted litigation. Given the present chaotic condition of land records in the country today, however, there is little scope for early changeover to such a mechanism”.

That report was made in 2001 and since then improvements have been made in land records through computerisation and the issue is worth further consideration. As title registration systems are parcel based and dependent on a comprehensive mapping

[33] One option may to be issue temporary occupation licenses or leases. The BMP/DMA data should provide the information necessary to issue these documents.

coverage, the issue must be addressed in conjunction with the options for improvement of the spatial framework. It would also be best implemented as a follow on from the extension of Bhoomi to the urban areas. It would also have the advantage of creating a single unified system, rather than the dual Registration Act/ Land Revenue Act systems in place now.

In the approach to developing a title registration system there are two basic options. The first is to embark on a major revision settlement program in order to obtain the land ownership information to establish the system. The second is to establish the system using the best available information from existing records, including the Bhoomi, KAVERI and the property tax Khata records which are presently being upgraded, to create provisional titles as an interim step towards fully fledged registered titles. The relative advantages and disadvantages of the options are set out in the Table below.

Table 6 - Strategic Options to Develop a Title Registration System.

Option	Approx. Cost/ Timeframe	Advantages	Disadvantages
3.1 Undertake a major revision settlement program	Rs 1,000 crore + 20 years+	1. High accuracy. 2. Substantial interaction with the community. 3. Consolidates holdings, updates mutations/phodi	1. Needs to be managed carefully or could create social unrest. 2. Urban process has not been demonstrated in a form that can be scaled-up. 3. Very high cost and long timeframe – difficult to get political support. 4. Needs substantial out-sourcing to reduce cost/timeframe.
3.2 Make use of best available information	Low cost (subject to agreement with BMP & DMA on use of data). Timing dependent on: • Development of spatial framework; • Extension of Bhoomi to urban areas; • Introduction of supporting legislation	1. Builds on recent spatial/ attribute data collection by BMP and DMA and attribute data in Bhoomi. 2. Direct link to BMP and DMA parcel IDs and attributes. 3. BMP and DMA validation of data – both initially and on-going. 4. All property mapped (including informal settlements). 5. Low cost and quick.	1. Retrospective investigation of title still necessary while title provisional. 2. Parcel boundaries not very accurate – but no gaps/overlaps 3. DMA and BMP collecting information on 'taxpayers' not owners. 4. Initial DMA tax mapping only covering 57 major urban centres (but DMA planning to extend program).

Irrespective of which option is chosen, it will be necessary to introduce new legislation to support the system and progressively withdraw the current system.

Explanatory Note on Provisional Titles

The system of registration of title is one that has been adopted in various shapes and forms in many countries around the world. However it is not an easy task to move from a system where title to land is unclear or requires extensive verification to ensure validity to one where tile is conclusive and carries a State guarantee. To convert such titles may require such extensive survey and legal investigation that a large scale program would be beyond the budgetary and human resource capacity of Governments. One option is to convert a title on the application of an owner who is prepared to pay the costs involved, but this inevitably means that conversion will take many years and may never be completed. Given the benefits to the Government and the public of having a single comprehensive land registration system, many Governments have taken steps to speed up the process.

One alternative that has been adopted by a number of countries in more recent times is to move progressively towards title registration through a system of establishing provisional or qualified titles. Under this system land will be brought into the title registration system with limited investigation and a provisional title will be issued. The title is much the same as a fully fledged title under a title registration system except that it is not conclusive and would be subject to any interests existing in the land which may not be disclosed in the title. Thus a search behind the title to preceding transactions is still necessary. However, the advantage of this approach is that the land can be dealt with using the same forms and procedures as land in a fully fledged title. Although the land may be subject to any interests created before the issue of the title and not noted thereon, from the point in time when the title is issued any future transaction with the land must be recorded on the title to be a valid legal interest. Furthermore, with the effluxion of time, or with the earlier presentation of further evidence, the title can mature into a conclusive title. In the meantime any person having an interest in the land which existed prior to the issue of the title and which is not recorded on the title can come forward and have that interest noted on the title. Thus, it is desirable that maximum publicity be given to the provisional title issue process.

The usual period of time necessary for a title to be released from its provisional status is the period equivalent to the period under the Limitations Act whereby a title based on adverse possession can be obtained. In India, as in a number of other countries this is 12 years. This period can be shortened where an owner can provide satisfactory proof of good title.

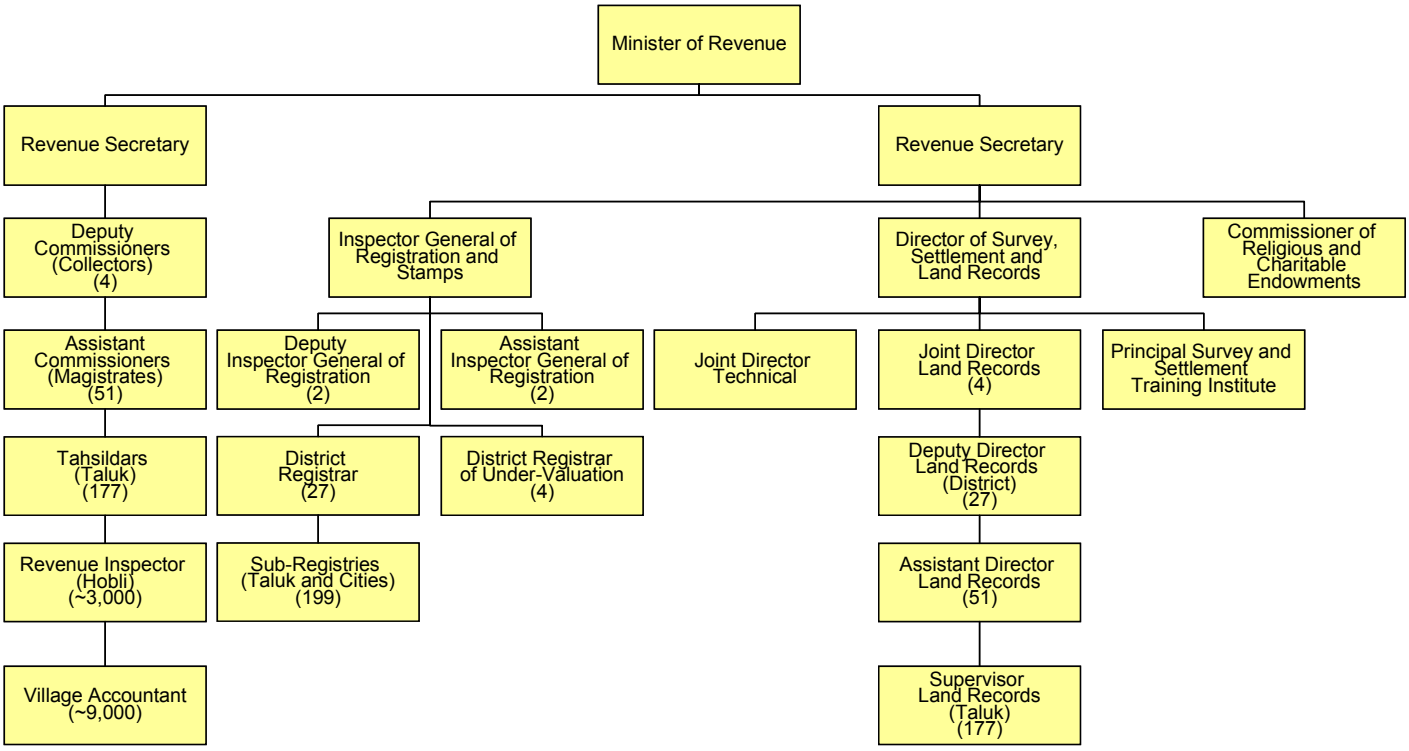
Accuracy of Parcel Boundaries

One matter which may not necessarily be included in the law but which should be determined as a matter of policy relates to boundaries. Although boundaries located with high precision may be an advantage to a title registration system they are not essential. In some cases, particularly in developing countries, the surveying and mapping has been undertaken with cheap cost effective methods, rather than expensive high precision methods in order to save time and money. This approach is not confined to developing countries. In England, which operates on a title registration system, many of the title boundaries have not been measured but are what is known as “general boundaries”. These boundaries are defined by the existing buildings, walls, fences and hedges, rather than by fixed measurement. After all, title registration systems may sometimes (but not always) guarantee title but they do not generally guarantee boundaries. The maps and plans proposed to be used in the system in Karnataka will all be based on measured boundaries – the tippan in rural areas and the taped boundaries for the tax maps for the Municipalities and Bangalore. These measurements have been used to produce the village maps in rural areas and the tax maps in urban areas. These maps have the status of indices to the field measurements. The maps do not have legal status but will correctly show the relationship of the land to adjoining parcels and show other features such as roads and public land. It is considered that the survey and measurement records are suitable for initial title issue under the title registration system and there are plans to progressively upgrade many of these maps in the future. Furthermore if any owner wishes to have their land parcel boundaries located more precisely they may pay the cost of a re-survey.

2.5.4 Institutional Arrangements

The current organisational structure of the agencies administering land records is shown in Figure 4. Addressing the issue of fragmented land record systems and multiple agencies referred to in paragraph 2.4.8 requires administrative and organisational reform if major improvements in efficiency and service delivery are to be made. Such a step would be necessary, in any event, if the existing system were to be replaced by title registration.

Figure 4 - Existing Organisation Chart of Land Administration Agencies.



These major improvements would best be achieved by a merger of the existing land recording, registration and survey and mapping functions under the Registration Act, 1908 and Land Revenue Act, 1964 into a single agency focussed on land administration.

The establishment of such an agency would provide;

- Savings in operating costs.
- More efficient processes.
- Better service delivery.
- Sharper focus on land administration.

The restructure should not require any supporting legislation. The main operating Acts viz. the Land Revenue Act 1964, the Stamps Act, 1957 and the Registration Act, 1908 would not appear to require amendment. The change could take place upon Government approval and possibly some Rule amendments or new Rules.

There have already been moves to amalgamate some functions. The KARC in 2001 recommended that “At the field level, the Department of Survey Settlement needs to be merged with the Revenue Department and work under the overall supervisory and administrative control of the Deputy Commissioner”. As a result of this recommendation the Ministry of Revenue has recently taken the decision to bring all the survey maintenance functions of SSLRD under direct control of the Tahsildar and the overall control of the Deputy Commissioner within Revenue Department, thereby abolishing most of the senior positions in SSLRD and leaving only a small unit for creation of new surveys.

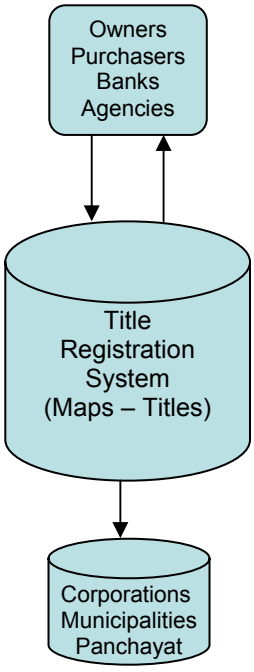
2.6 Long Term Vision for Karnataka

Based on the perceived problems in the existing system, the future needs of the State and on recent international trends, the following long-term vision for Karnataka is suggested:

> *A single, unified, comprehensive, cost-effective and up-to-date system to record rights in land that ensures security of title to landowners and provides land parcel information to Government and private users.*

An illustration of this vision is set out in Figure 5, which is contrasted with the current situation set out in Figure 1. Central to this new data flow is a single title registration system that includes conclusive information on rights in land and the spatial extent of these rights. This information is updated directly in response to requests for registration of dealings in rights. The information is available for the general market, including owners, prospective purchases, providers of credit, investors etc and is provided to Corporations, Municipalities and Panchayat as the basis for their tax Khata.

Figure 5 – Illustration of Long-Term Vision in Karnataka

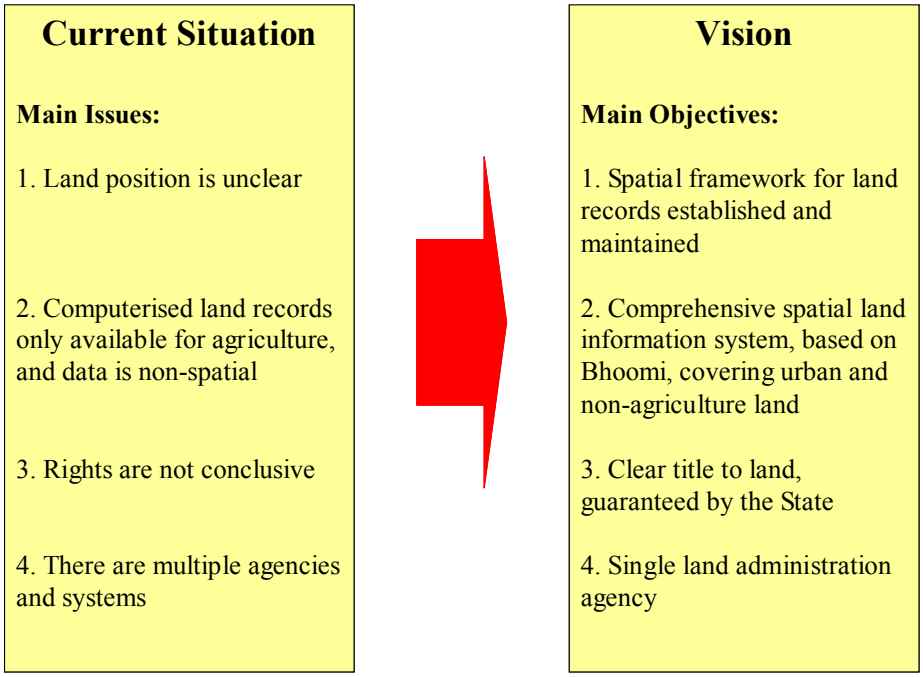


To achieve this vision, four objectives must be realised. These are:

- **Objective 1.** A strong spatial framework for land records in both rural and urban areas.
- **Objective 2.** A comprehensive spatial information system on rights in land, based on Bhoomi, extended to cover urban and non-agriculture land.
- **Objective 3.** Certainty in Rights in Land.
- **Objective 4.** Single land administration agency.

These objectives are illustrated below in Figure 6.

Figure 6 - Key Objectives.



A long-term strategy to achieve this vision and these objectives is summarised in Table 7.

Moving from a system of registration of deeds to a system of registration of title with state guarantee was a core element of the long-term aspirations for the land administration system raised by Sri Rajeev Chawla and his team in discussions during the study. The move to a state guaranteed title registration was re-affirmed during the workshop with key stakeholders on 6 September. This objective has been built into the long-term strategy and forms part of the short-term action plan. There has been considerable discussion in India on this topic. Professor Wadhwa's 1989 report makes the clear recommendation that a system of registered title with state guarantee should be implemented.

Introducing a title registration system will involve significant new legislation. Prior to drafting this new legislation considerable discussion will be required by key stakeholders to reach consensus on the policy and principles for title registration. A key element in this discussion will be the mechanisms and arrangements for providing state guarantee. The requirement for new legislation introduces an element of risk in the proposed activity, with the possibility of delays should there be more

difficulty than anticipated in getting the new legislation enacted. However it should be noted that the Vision and objectives can still largely be achieved without introducing a title registration system. By improving the spatial framework for the land records, modifying Bhoomi to incorporate spatial data, extending Bhoomi to include urban and non-agriculture land, introducing Bhoomi into the registration process and undertaking institutional reform – all actions that can be undertaken without significant legislative change – Karnataka will have a significantly improved deeds registration system. To realise the benefits of this, at a minimum, work will be required to re-engineer processes and integrate Bhoomi and KAVERI.

Table 7 – Long-Term Strategy in Karnataka.

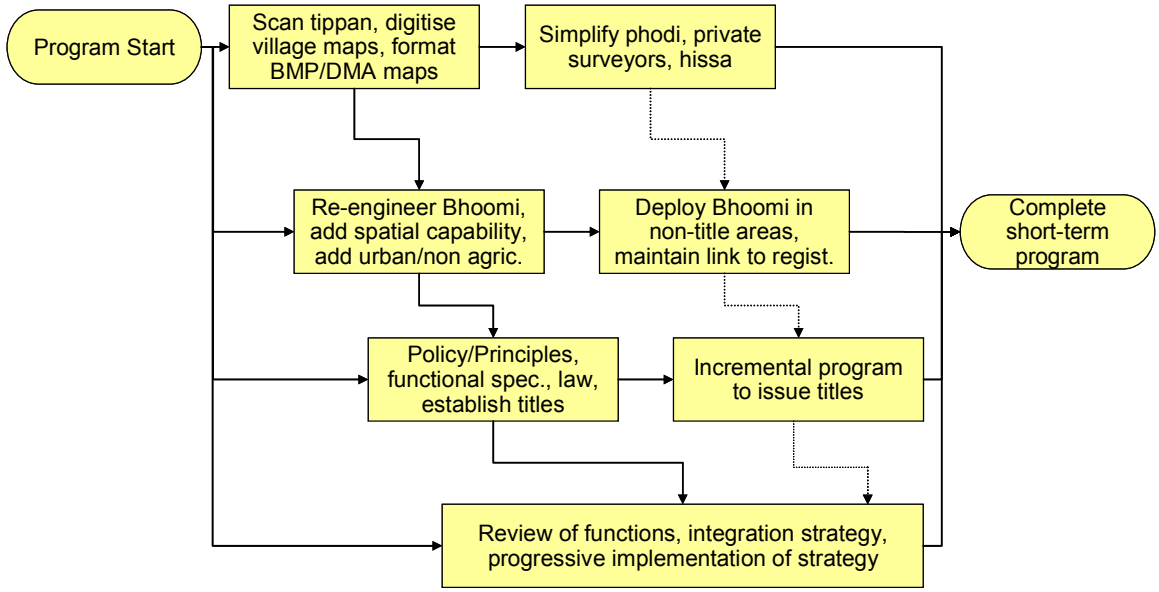
Objective	Strategy		
	Short-Term	**Medium-Term**	**Long-Term**
1. Strong spatial framework for land records in both rural and urban areas.	1.1 Archive the tippan records 1.2 Reach agreement with TPD, BMP and DMA on access to base mapping and tax maps/attributes. 1.3 Prepare functional specifications and design to modify Bhoomi to accept spatial data: • Vector village maps • BMP/DMA tax maps 1.4 Transfer/validate/input village maps, BMP and DMA tax mapping in a form suitable for the re-engineered Bhoomi. 1.5 Ensure phodi before registration, streamline the phodi process, ensure successful involvement by a strong private survey sector and develop and implement a hissa program to address phodi backlog.	1.6 Program on a priority basis to upgrade the spatial framework with photogrammetric mapping and ground survey. 1.7 Program to improve the geo-reference of the cadastral data. 1.8 Scaling up of hissa program.	1.9 Completion of hissa program.

Objective	Strategy		
	Short-Term	**Medium-Term**	**Long-Term**
2: A comprehensive spatial information system on rights in land, based on Bhoomi, extended to cover urban and non-agriculture land.	2.1 Study into the current and future user needs of the RTC and where agriculture data is best captured and maintained. 2.2 Re-engineer Bhoomi (categorising data types) and incorporate spatial data. 2.3 Input appropriate fields from BMP/DMA data. 2.4 Validate data (KAVERI, publicise, put information on the web, verification extract to each property holder) 2.5 Deploy Bhoomi in kiosks in Sub-Registries and on the internet, and use Bhoomi in the Sub-Registries as an aid to registration. 2.6 Maintain Bhoomi with link to KAVERI.	2.7 Maintain Bhoomi with link to KAVERI in non-title areas.	2.8 Maintain Bhoomi with link to KAVERI in non-title areas.
3. Certainty in Rights in Land.	3.1 Develop policy and principles for a registration of title system. 3.2 Prepare functional specifications and design to formulate a registration of title system (including private and public land). 3.3 Draft and obtain enactment of appropriate legislation. 3.4 Establish the title registration system using Bhoomi property data. 3.5 Functional reorganisation and staff training. 3.6 Piloting of incremental program to issue titles with public notice and replace existing systems.	3.7 Scaling up of program to issue titles. 3.8 Progressive conversion of provisional titles to full title. 3.9 Inclusion of all Government, State and public lands in the system	3.10 Comprehensive database of all land in Karnataka.
4. Single land administration agency.	4.1 Review of functions in land administration agencies (Revenue, SSLRD, IGSR) 4.2 Prepare detailed integration strategy, including funding and finance requirements. 4.3 Prepare rules and regulations to support new institution. 4.4 Progressive implementation of strategy.	4.5 Program to complete implementation of strategy.	

2.7 *Five Year Plan for Karnataka*

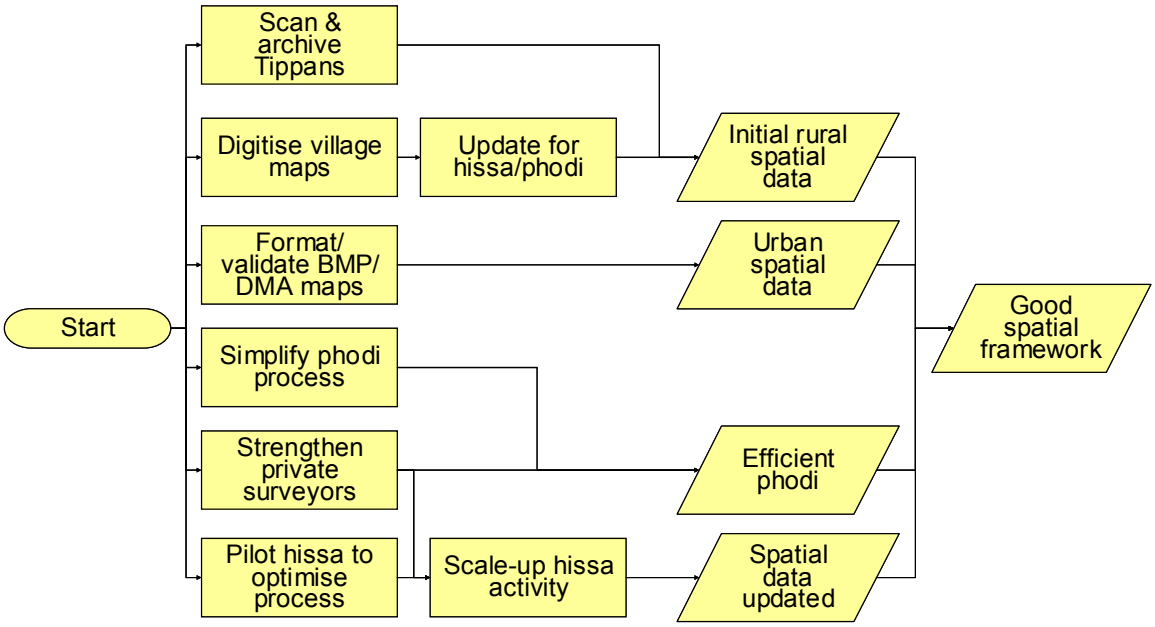
The logic for the action plan for the short-term is set out in Figure 7. Details for the short-term action plan set out in Table 7 are set out below and a 'ball-park' estimate of costs is set out in Table 8 starting on page 57. The time-based schedule of this activity is set out in Figure 12 starting on page 55.

Figure 7 – Overview of Key Short-Term Strategies.



2.7.1 Objective 1: Strong spatial framework for land records in both rural and urban areas.

Figure 8 – Activity to Establish a Spatial Framework for Land Records.



1.1 Archive the tippan records. GOI has provided funds to scan the tippan record. The Secretary E-Governance has offered Bhoomi funding for the scanning of tippan records. This program should be implemented quickly, but carefully. Scanning should be in colour to facilitate the interpretation of the scanned images. All tippan records should be scanned, including any hissa or phodi tippans, but there is little value in scanning the pakka or prapthi records. Due to the critical nature of this activity, the activity should be managed with appropriate project management protocols and with regular oversight by senior management.

1.2 Reach agreement with TPD, BMP and DMA on access to base mapping and tax maps/attributes. New data that is being produced by the Town Planning Department, Bangalore Mahanagara Palike and the Municipal Administration Department are essential to the extension of Bhoomi to urban areas. The Revenue Department should confirm with these agencies the availability of the data and any conditions attached to the availability of the data. This agreement should be recorded in a formal document.

1.3 Prepare functional specifications and design to modify Bhoomi to accept spatial data (raster village maps and BMP/DMA tax maps). Bhoomi currently operates purely as an alphanumeric database. The system has explicit reference to the survey numbers but the map information is not available to the users or operators of the Bhoomi system. A relatively cheap option to provide access in Bhoomi to the map data for the RTCs would be to use the raster scanned village maps being produced by KSRSAC. One option of implementing this is to input each raster image of a scanned village map as a backdrop in a CAD or GIS system, generate parcel centroids by digitising parcel labels, and attach parcel IDs to the labels. Bhoomi software would then need to be modified to manage the process of accessing the correct village map, provide the ability to centre and zoom around a particular centroid and then provide a mechanism to display, print or extract a portion of the raster image of the village map. There are two main difficulties with this approach. First, it is difficult to update the raster images of the village maps – the hard copy of the maps would have to be updated, the map rescanned and the database of scanned village maps updated. This difficulty can be addressed by using the maps as noting maps, adding a reference to a parcel on the scanned map to indicate that there is a change in the parcel pattern. Second, the village maps themselves are not updated. This difficulty could be addressed by searching the phodi records and either, redrawing and rescanning the village map, or by adding notation to the scanned village map to indicate that phodi records exist.

In the medium term it would be best to convert the settlement survey data to vector format. Although this process would involve both time and cost, it will generate data in a form that can be readily updated to reflect changes in the land parcel pattern (through phodi) and it would enable more flexible spatial search and reporting capability. Of the options listed in Table 2 (see page 33), the most accurate and cost-effective option is option 1.3.

The BMP and DMA data will be in vector form – the BMP data in GIS format and the DMA data converted from CAD to GIS format.

Bhoomi will need to be modified to accept GIS data (ultimately from the vectorised, mosaiced village data, the BMP data and the converted DMA data) and provide simple functionality to search, display and report by parcel identifiers to queries formulated in both the spatial and aspatial databases. The display and report option

will also need provide zoom capability. These functions are standard GIS capabilities and there are a range of software options available.

A contractor with GIS expertise should be hired to assist in the task of specifying, designing and implementing the spatial functionality in Bhoomi. There should be a strong preference for off-the-shelf rather than bespoke software solutions.

1.4 Transfer/validate/input village maps, BMP and DMA tax mapping in a form suitable for the re-engineered Bhoomi. As part of the transfer/validation of the data, the DMA data should be converted to GIS format. This will necessitate the polygonisation of the vector data. Off-the-shelf software is available for this task.

The spatial data will have to be validated when it is entered into Bhoomi to identify gaps and overlaps in the aspatial data. This task will also validate the existing RTC aspatial data as well as the aspatial data from BMP and DMA.

1.5 Ensure phodi before registration, streamline the phodi process, ensure successful involvement by a strong private survey sector and develop and implement a hissa program to address phodi backlog. In establishing a system to conclusively record rights in land, it is essential that the spatial records and the record of rights in land are aligned. To do this any phodi (subdivision) survey must be undertaken prior to registration of rights.

Steps will be required to ensure that this requirement does not impact on the mutation process. **First**, the phodi process should be reviewed, looking particularly at the accessibility of the process to the public, and the approval processes. **Second**, given the limited resources in government, having a strong private sector will also be important. The problems with the High Court Writ should be addressed as a matter of urgency. The process of access to records by private surveyors should be reviewed, with consideration given to making copies of the records available at no or minimal cost. A program of on-going training and development would also help build a strong private sector. Lifting the fees charged by SSLRD for phodi surveys to a level that at least recovers the cost of providing the service would also assist in removing the distortion in the differential cost of phodi services by SSLRD and private surveyors. **Third**, it is clear that a large program is required to clear the backlog of requests for phodi, including the requests being held by the Tahsildars as well as picking up informal phodi. This systematic program would be along the lines of the hissa program that updated the settlement surveys between 1930 and 1950. This program should be conducted on a systematic manner, with priority given to areas of significant development (which are likely to be indicated by phodi backlog). The program is likely to involve substantial work over a number of years (at least 1 million surveys). Given the size of the task and the need to strengthen the private sector, it seems logical that a substantial part of this program be undertaken by private surveyors under the supervision of SSLRD. Initial pilot activity will be essential to develop and field test cost-effective and efficient techniques that can be scaled up. A range of technical options for survey should be tested, including:

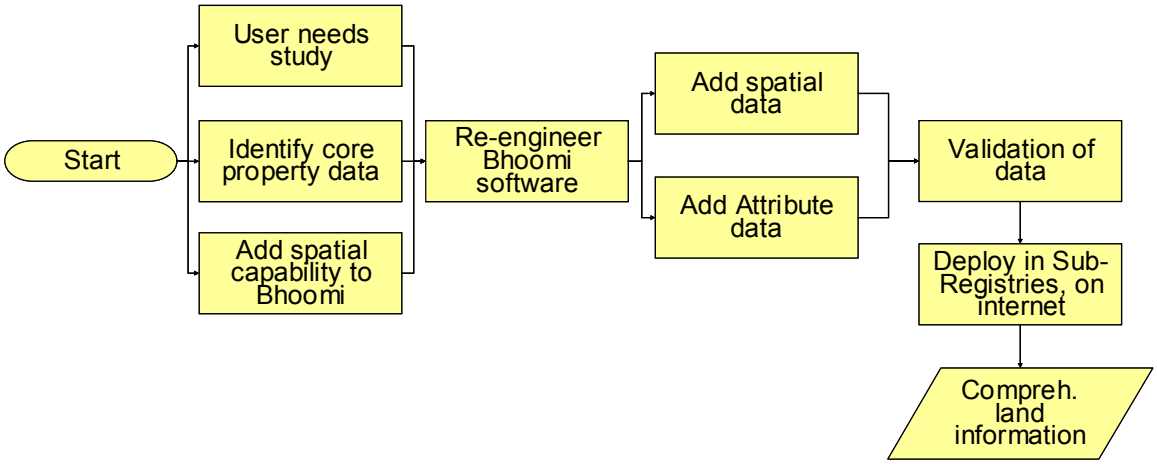
- the preparation of individual tippans based on tape surveys (Madras method) or a continuation of the Cross-Staff and the agreement of adjoining land owners (likely to be cost effective for isolated surveys in areas where there is no control)

- optical square surveys from control traverses (an improved method in areas where there is control);
- the use of differentially rectified photomaps (a low cost method useful in rural areas where there is a lot of survey work required in a locality);
- the use of hand-held differential GPS instruments (likely to be useful in rural areas when instruments and trained personnel are available).

The hissa activity will need to be scaled-up in a flexible manner. In areas where isolated surveys are needed the methodology will be very similar to the phodi process. However where extensive survey is required the process may involve a re-survey.

2.7.2 Objective 2: A comprehensive spatial information system.

Figure 9 – Activity to Establish a Comprehensive Spatial Information System for Land Records.



2.1 Study into the current and future user needs of the RTC and where agriculture data is best captured and maintained. As noted previously, Bhoomi is a computerisation of the traditional RTC system. It contains data on aspects such as soil, irrigation, crops etc. that were appropriate when land revenue from agriculture land was far more important that it is now in Karnataka. Various other systems that provide services to farmers have evolved on the basis that RTC data is available. These systems include the provision of credit to farmers and crop insurance. Legislation is also based on the availability of RTC data. For example, the ceiling on holdings under the Land Reform Act is stipulated in terms of the type of irrigation available to the land and hence the productivity of the land. A study should be undertaken into the current and future requirements of existing and future users of data on agricultural land and where this data might best be collected and maintained.

2.2 Re-engineer Bhoomi (categorising data types) and incorporate spatial data. Regardless of the outcome of the study on the current and future needs of the RTC, the data in Bhoomi can be categorised into three groups:

1. Data that relates directly to rights in land that the state might be prepared to guarantee at some time in future, including:

- Parcel identity (but not specified parcel area or dimensions) with a direct link to the spatial framework;
- Owner; and
- Individuals or entities with a registered right in the property (providers of secured credit, individuals or entities with a charge or lien on the property etc.).

2. Data that relates directly to rights in land, but items that the state is not prepared to guarantee (now or in the future):
   - Parcel area and dimensions.
3. All other items of data which Bhoomi can effectively and efficiently collect and maintain **and** which are deemed necessary to support government policy and current and future users.

To facilitate the evolution of Bhoomi to a system that records secure rights in land, Bhoomi should be re-engineered to group data on this basis with a concentration on data types that are directly related to rights in property.

Another modification that will be essential to the long-term development of Bhoomi will be establishing a closer link to the spatial framework. This link initially might best and most cost-effectively be implemented in agricultural areas by providing the ability to display raster images of properties in Bhoomi and perhaps KAVERI.

2.3 Input appropriate attribute fields from BMP/DMA data. Only data fields from the BMP and DMA databases that are directly related to property, and the BMP/DMA identifiers should be input into the modified Bhoomi (this will probably be restricted to the nominated owner's names, tenure status, and the approximate area and dimensions. Associated information that would be useful in an urban Bhoomi would be the khata identifier, occupier's names, street address, and building area). The data will be linked to the BMP/DMA spatial data. Prior to being input, it should be verified that no public land is being claimed by a BMP/municipality tax payer. All data records should be input into Bhoomi, including records for groups not formally classified as 'owners'. As a result the modified Bhoomi should include a field recording tenure status. Where BMP/DMA data shows a parcel as having multiple land owners it will be necessary to confirm the relationship under which these persons hold such land. As the urban Bhoomi will be generated from the BMP and DMA databases there will be an initial one-to-one relationship between these systems as Bhoomi.

Going forward it would assist all parties if this relationship could be maintained. One way to do this would be to have a central database at state or local level. This is an idea being considered by the Secretary of e-Governance. To be successful, this approach will need the cooperation of all parties and will need to demonstrate that the data can be distributed efficiently to the local offices through a state wide-area-network (WAN) at state level, or a metropolitan-area-network at a local level. If this is not possible then other options, such as daily replication of databases can be explored.

2.4 Validate data (with KAVERI, publicity campaigns, put information on the web, provide verification extract to each property holder). Although the processes being adopted by BMP and DMA provide mechanisms for the correction

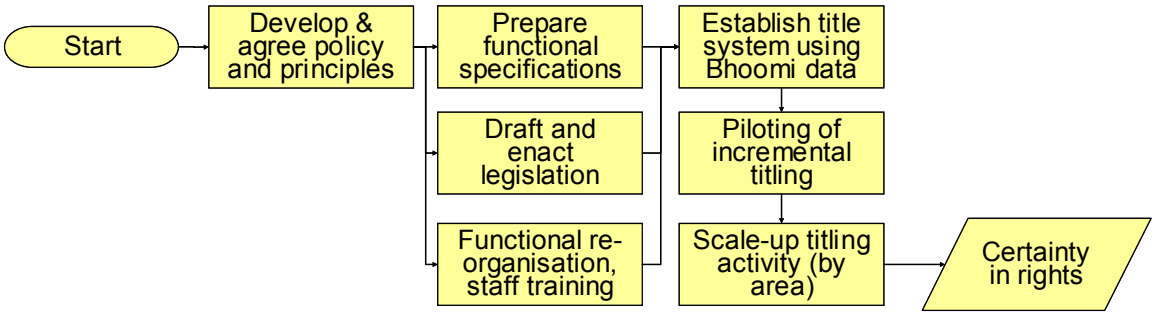
of the BMP/DMA databases by property holders, once the data is transferred into an 'urban' Bhoomi it would seem prudent that property holders be given a copy of the record and be given the opportunity to correct the record. This step would need to be preceded by a publicity campaign to inform the public of the developments taking place. In addition, an encumbrance search should be made against KAVERI not only to validate ownership, but also to identify any other interests affecting the land.

2.5 Deploy Bhoomi in kiosks in Sub-Registries and on the internet, and use Bhoomi in the Sub-Registries as an aid to registration. The Inspector General of Registration is currently considering amending registration procedures to require proof of title prior to registration. Bhoomi would be very useful in this regard. Consequently, Bhoomi should be made available to the Sub-Registrars. It should also be made available to the general public through the kiosks in Sub-Registries. There is an established clientele for the rural Bhoomi. There is no established clientele for an 'urban' Bhoomi and one will have to be developed. The logical initial focus for the 'urban' Bhoomi is the network of Sub-Registries. Kiosks providing access to spatial data for customers of the Sub-Registry and the public generally can relatively easily be provided and will enable a check on property rights prior to registration. A second step could be the integration of the spatial data into the registration process. The final step would be to provide remote access to the spatial and aspatial data to key players in the real estate market such as banks, housing finance companies, lawyers, real estate agents etc.

2.6 Maintain Bhoomi with link to KAVERI. Having made the investment in the establishment of the extended database for Bhoomi it is essential that the database be kept up to date. The database for agricultural land is currently maintained through advice from KAVERI of registered transactions, together with mutation requests lodged with Bhoomi. KAVERI should be set up to also forward to Bhoomi advice on registered transactions with urban and non-agricultural land.

2.7.3 Objective 3: Certainty in Rights in Land.

Figure 10 – Activity to Establish Certainty in Rights.



3.1 Develop policy and principles for a registration of title system. This is the first step in creating a title registration system. Title registration systems will vary from one country to the next but this is generally a variation in detail. All title registrations systems follow the same basic principle viz. a transaction with land obtains its validity from the act of registration by the State. Without registration the transaction will not be recognised by the law as creating a legal interest in the land. Once registered the right in land is shown on the certificate of title and the holder of

that right may (with some exceptions) be regarded as holding that land free from any other rights other than those recorded on the title. This is known as conclusiveness or indefeasibility and must be enshrined in the law. However, beyond this basic principle, decisions must be made on a range of issues relating to the manner in which a title registration system should operate which must also be embodied in the law. These include matters such as:

a) the extent of indefeasibility and what exceptions there should be to the general principle;

b) the extent of the State guarantee. One of the principles of the Torrens system of title registration was that the titles would be certified by the State and if anyone suffered a loss through error or the operation of the system they should be compensated out of a fund established for that purpose. Nevertheless there are title registration systems that operate successfully without a compensation fund, nearby examples being Thailand and Malaysia. Where a fund does exist it is usually built up and maintained by a small levy on the dealings that are presented for registration. In the early days of these funds they were defended vigorously against all claims. Nowadays many registries use the fund to enable them to operate on a business risk basis.

   In most title registration systems the State guarantee does not extend to a guarantee of the area and boundary measurements of a parcel.

   In the case of India all recommendations for the introduction of title registration have been for a system supported by a State guarantee and an indemnity fund. Consequently, given these expectations, an Assurance fund has been included in this proposal but the matter is one that could be the subject of further study.

c) the use of provisional titles. This has been recommended as an expedient way to quickly establish the system. It will be necessary to determine the policy for dealing with rights in land which were not recorded on the title at the time of issue but are later brought to notice and also the situations in which a provisional title may mature into a full title. Also, while the use of provisional titles has been recommended, there could be situations where a full title may be issued in the first instance, such as where the land was acquired by a development authority under compulsory acquisition and is now being sold. In that case it would be a clear title without the possibility of subsisting interests.

d) the machinery for handling disputes arising from the issue of titles.

e) what land will be the subject of the system. Ideally, the system should be capable of including not only privately owned land, but also all Government land so that the system is a complete record of all land in the State.

The development of this policy and principles should be undertaken in consultation with stakeholders and interested parties.

3.2 Prepare functional specifications and design to formulate a registration of title system (including private and public land). Having determined the basic policy and principles, the registration processes must be designed. The basis of title registration is a parcel based record known as a title which contains:

a) a description of the land (normally by reference to a lot in a plan).

b) the details of the owners of the land.

c) details of any encumbrances that affect the land (easements mortgages, leases etc.)

The record is generally referred to as the land register. This record may be kept on either paper or computer, although the trend is to keep it on computer. A paper copy of the record, known as a certificate of title is issued to the owner. Also kept in the system are the documents of transactions which have taken place with the land and been registered. These may be kept in paper or image form although the trend is to scan them and store the images on disk.

As a result of a titling program, sometimes called first registration, (including a program to convert lands from deeds registration to title registration) parcel records are created and titles issued. From that point on any transaction with the land must be registered to be effective. Transactions are registered by presenting to a title registry for registration a signed and witnessed document evidencing the transaction. The documents are normally required to be in simple panel forms – easy to check and collect data from. The document would be numbered and then checked by registry officers to ensure that it was a valid transaction and, if in order, would be registered by updating the parcel record (similar to a mutation under the Land Revenue system).

In a manual system the certificate of title would be updated by a notification recorded on it, while in a computer system a new certificate of title would be printed from the updated database.

Persons interested in the land may obtain a copy of the current title record. They may also obtain a copy of any registered transaction document and any plan. In the case of a subdivision of a land parcel the plan of subdivision must be lodged with the registry for registration after which new parcel records will be created for the parcels in the plan. New certificates of title will be issued and any transaction with the land may then be registered. The plan would be scanned and an image held.

Decisions must be made on the extent to which these registration processes will be automated and the automated operating procedures must then be specified and the appropriate software developed. Forms would be designed at this stage.

3.3 Draft and obtain enactment of appropriate legislation. Having developed both the basic principles and the operating procedures of the title registration system, appropriate legislation to support the system must be put in place. This legislation should set out not only the basic principles of the system but also the basic operational procedures. More detailed procedures would be set out in subsidiary rules. Transitional provisions to progressively replace the existing systems such as the Registration Act system would be necessary.

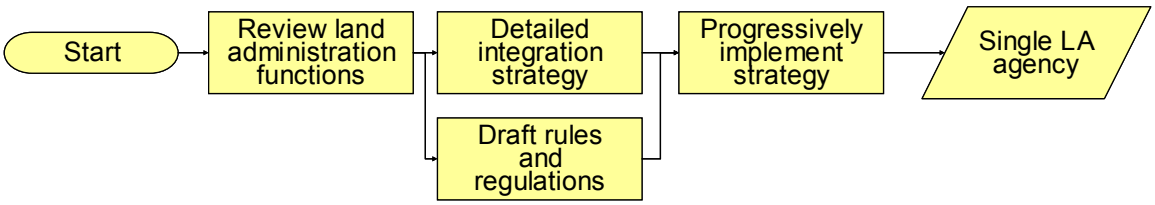
3.4 Establish the title registration system using Bhoomi property data. At this point Bhoomi would have been reengineered and would contain a database of agricultural, non-agricultural and urban land. This database, which would have been through various forms of validation at the time of entry of the data into Bhoomi, would be used as the basic source of information for the issue of titles under the title registration system. It would not be necessary for the database to be complete as the title registration system would be created on an area by area basis.

3.5 Functional reorganisation and staff training. The registration of titles system will be an entirely new and different system to the Registration Act and Land Revenue Act systems as it will be necessary for transactions to be checked to ensure their validity before registration. It will require a restructuring of the existing organisations and considerable staff training. It will be necessary to review existing organisation structures, develop and put in place new structures, prepare Rules and manuals of procedure and train staff in the new procedures. The most appropriate operational locations would be the existing Sub-Registrars offices.

3.6 Piloting of an incremental program to issue titles with public notice and replace existing systems. Once the system is ready to commence operations a pilot area should be chosen and titles issued for all the land within that designated area, accompanied by extensive publicity and public education campaigns. Where provisional titles have been issued, persons who claim an interest in the land which may not be recorded on the title would be able to come forward and request the recording of that interest. After evaluating the performance of the system and making any necessary adjustments the system would be incrementally extended on an area by area basis.

2.7.4 Objective 4: Single land administration agency.

Figure 11 – Activity to Establish a Single Land Administration Agency.



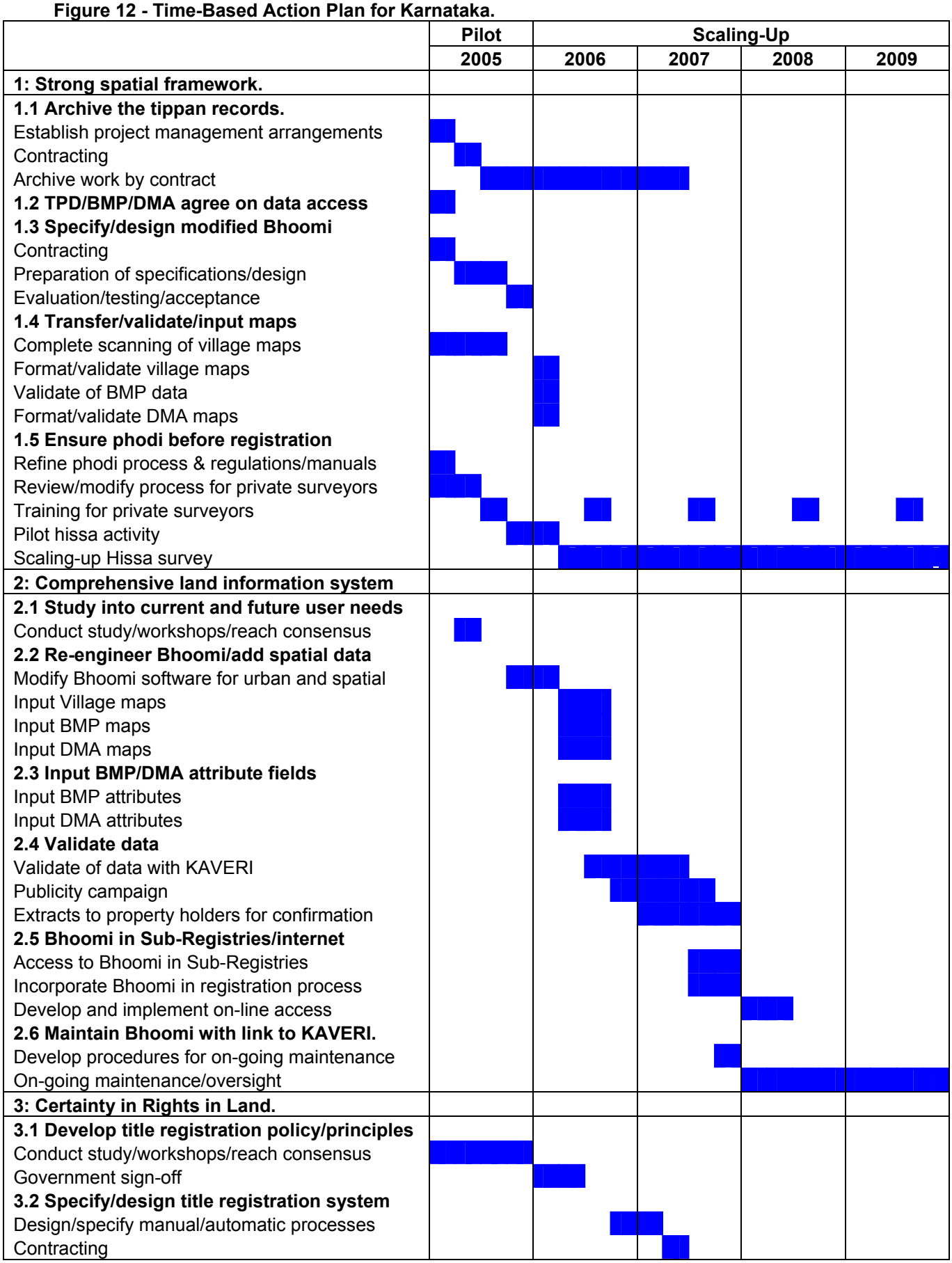
4.1 Review of functions in land administration agencies (Revenue, SSLRD, IGSR) Undertake a review of the land administration functions carried out by the three agencies. With the objective of establishing a single comprehensive title registration system, identify those functions which should be discontinued, and those which should be merged in order to administer the system by a single agency.

4.2 Prepare a detailed integration strategy, including the funding and finance requirements. It would be necessary to develop a human resource strategy for the abolition of positions in the former agencies, the filling of positions in the new agency and the handling of redundancies. Budget for the new agency would then have to be established.

4.3 Prepare rules and regulations to support new institution. To the extent that the existing institutions are recognised and supported by the law, that law would have to be repealed and replaced by a new law supporting the new agency. Transitional provisions would be necessary.

4.4 Progressive implementation of strategy. An interim body would be created, headed by the Secretary of the new agency, tasked with the responsibility of setting up the new agency.

Figure 12 - Time-Based Action Plan for Karnataka.



	Pilot	Scaling-Up			
	2005	2006	2007	2008	2009
Develop automated title software					
3.3 Draft/obtain enactment of legislation					
Draft legislation					
Government sign-off					
Enactment					
3.4 Establish titles using Bhoomi data					
Data entry/verification					
3.5 Functional reorganisation/staff training					
Functional review/reorganisation					
Prepare manuals/staff training material					
Staff training					
3.6 Incremental program to issue titles					
Publicity campaign					
Incremental deployment					
4: Single land administration agency.					
4.1 Review of LA functions					
Review/report/workshop/consensus building					
4.2 Prepare detailed integration strategy					
Develop strategy					
Government sign-off					
4.3 Prepare rules and regulations					
Draft rules and regulations					
Implement rules and regulations					
4.4 Progressive implementation of strategy					
Progressive implementation.					

Table 8 - 'Ball-Park' Estimate of the Cost of the First Five Years of the Strategy in Karnataka.

	Units	Unit Cost Rs	Cost (Rs)	Cost US$	Period Cost (US$)		Comments
					Pilot	Scaling-Up	
1: Strong spatial framework.			**1268700000**	**28,193,333**	**224,444**	**27,968,889**	
1.1 Archive the tippan records.				-		-	
Establish project management arrangements				-		-	
Contracting				-		-	
Archive work by contract	15000000	2	30000000	666,667	180,000	486,667	Outsource to contractor
1.2 TPD/BMP/DMA agree on data access				-		-	
1.3 Specify/design modified Bhoomi				-		-	
Contracting				-		-	
Preparation of specifications/design	1	1000000	1000000	22,222	22,222	-	Outsource to contractor
Evaluation/testing/acceptance				-		-	
1.4 Transfer/validate/input maps				-		-	
Complete scanning of village maps				-		-	
Format/validate village maps	30500	1000	30500000	677,778		677,778	Outsource to contractor
Validate of BMP data	1	500000	500000	11,111		11,111	Outsource to contractor
Format/validate DMA maps	57	100000	5700000	126,667		126,667	Outsource to contractor
1.5 Ensure phodi before registration				-		-	
Refine phodi process/prepare regulations/manuals				-		-	
Review/modify arrangements for private surveyors				-		-	
Training for private surveyors				-		-	
Pilot hissa activity	1	1000000	1000000	22,222	22,222	-	Incremental costs
Scaling-up Hissa survey	4000000	300	1200000000	26,666,667		26,666,667	Outsource to private surveyors - estimate based on 20% requirement
2: Comprehensive land information system			**572,225,000**	**12,716,111**	**55,556**	**12,660,556**	
2.1 Study into current and future user needs				-		-	
Conduct study/workshops/reach consensus	1	500000	500000	11,111	11,111	-	Incremental costs
2.2 Re-engineer Bhoomi/add spatial data				-		-	
Modify Bhoomi software for urban and spatial	1	2000000	2000000	44,444	44,444	-	Outsource to contractor
Input Village maps	30500	50	1525000	33,889		33,889	Outsource to contractor
Input BMP maps	1	1000000	1000000	22,222		22,222	Outsource to contractor

	Units	Unit Cost Rs	Cost (Rs)	Cost US$	Period Cost (US$)		Comments
					Pilot	Scaling-Up	
Input DMA maps	57	100000	5700000	126,667		126,667	Outsource to contractor
2.3 Input BMP/DMA attribute fields				-		-	
Input BMP attributes	1	500000	500000	11,111		11,111	Outsource to contractor
Input DMA attributes	57	500000	28500000	633,333		633,333	Outsource to contractor
2.4 Validate data				-		-	
Validate of data with KAVERI	4750000	50	237500000	5,277,778		5,277,778	Outsource to contractor
Publicity campaign	199	500000	99500000	2,211,111		2,211,111	Outsource to contractor
Extracts to property holders for confirmation	4750000	20	95000000	2,111,111		2,111,111	Outsource to contractor
2.5 Deploy Bhoomi in Sub-Registries/internet				-		-	
Access to Bhoomi in Sub-Registries (staff/public)	199	500000	99500000	2,211,111		2,211,111	Outsource procurement, installation, training etc
Incorporate Bhoomi in registration process				-		-	
Develop and implement on-line access	1	1000000	1000000	22,222		22,222	Outsource to contractor
2.6 Maintain Bhoomi with link to KAVERI.				-		-	
Develop procedures for on-going maintenance				-		-	
On-going maintenance/oversight				-		-	
3: Certainty in Rights in Land.			**153900000**	**3,420,000**	**11,111**	**3,408,889**	
3.1 Develop title registration policy/principles				-		-	
Conduct study/workshops/reach consensus	1	500000	500000	11,111	11,111	-	Incremental costs
Government sign-off				-		-	
3.2 Specify/design title registration system				-		-	
Design/specify manual/automatic processes	1	5000000	5000000	111,111		111,111	Outsource to contractor
Contracting				-		-	
Develop automated title software	1	10000000	10000000	222,222		222,222	Outsource to contractor
3.3 Draft/obtain enactment of legislation				-		-	
Draft legislation	6	1000000	6000000	133,333		133,333	Cost based on TA assistance
Government sign-off				-		-	
Enactment				-		-	
3.4 Establish titles using Bhoomi data				-		-	
Data entry/verification	1	10000000	10000000	222,222		222,222	Outsource to contractor
3.5 Functional reorganisation/staff training				-		-	
Functional review/reorganisation	3	1000000	3000000	66,667		66,667	Cost based on TA assistance

	Units	Unit Cost Rs	Cost (Rs)	Cost US$	Period Cost (US$)		Comments
					Pilot	Scaling-Up	
Prepare manuals/staff training material				-		-	
Staff training				-		-	
3.6 Incremental program to issue titles				-		-	
Publicity campaign	199	100000	19900000	442,222		442,222	Outsource to contractor
Incremental deployment	199	500000	99500000	2,211,111		2,211,111	Incremental costs, including tribunal
4: Single land administration agency.			**204500000**	**4,544,444**	**-**	**4,544,444**	
4.1 Review of LA functions				-		-	
Review/report/workshop/consensus building	1	500000	500000	11,111		11,111	Incremental costs
4.2 Prepare detailed integration strategy				-		-	
Develop strategy	3	1000000	3000000	66,667		66,667	Cost based on TA assistance
Government sign-off				-		-	
4.3 Prepare rules and regulations				-		-	
Draft rules and regulations	2	1000000	2000000	44,444		44,444	Cost based on TA assistance
Implement rules and regulations				-		-	
4.4 Progressive implementation of strategy				-		-	
Progressive implementation.	199	1000000	199000000	4,422,222		4,422,222	Incremental costs, possible civil works, procurement, staffing training etc
Total Costs			**2,199,325,000**	**48,873,889**	**291,111**	**48,582,778**	

CHAPTER 3 - LESSONS FOR OTHER STATES

Karnataka and its land records share a legacy with other Indian states. There is therefore value in documenting the key lessons of Karnataka's recent experience, both successful and unsuccessful, in computerising its land records. These key lessons are summarised below.

Need for a Champion. A key reason for the success of Bhoomi has been the presence of one key champion – Sri Rajeev Chawla. He stayed with the project longer than could reasonably be expected and persevered through the many difficulties to bring the project to a successful conclusion. As project champion, he brought together a dedicated team to work on the project. The partnership with the National Infomatics Centre (NIC) has been critical to the success of the project. In recent times he has brought together a number of key specialists from the various land sector agencies, including experienced staff from the Taluk Revenue offices and the SSLRD. These staff bring the domain knowledge necessary to built on Bhoomi's success.

Sri Rajeev Chawla is now playing a national role as Convenor of the national committee of Revenue secretaries oversighting efforts to computerise land records. But there is only one Rajeev Chawla and other states need to find their champions and give them the necessary resources and support. The senior staff charged with the oversight of land records used to be the 'cream' of the bureaucracy. This has degenerated to the stage where senior staff see being assigned to the oversight of land records as a punishment. This problem will not be easily changed, but a critical element in effecting significant change will be the provision of adequate resources.

Limited Technical Capability. In Karntaka there is limited technical capability in survey, mapping and GIS, particularly in government. A key long-term factor causing this problem has been limited opportunities and support for the land sector. This problem can be addressed with a range of strategies, including:

- Offering increased opportunities for government staff – access to new technology, training, challenging work etc. - by implementing well designed programs to address problems with land records;
- As part of these programs, building a strong private sector with a real role in supporting land administration;
- Support for the education sector to enhance land administration-related courses and to encourage students to enter the field.

Technical Specifications and Quality Control. The key agencies supplying survey and map data have had difficulty in providing data to internationally accepted standards (see for example, the difficulties experienced by MSDIP with SI and NRSA data detailed on page 21). This difficulty is compounded by an apparent tendency to treat digital data as 'error-free' regardless of the source or methodology used to produce the data. The key lesson here is that some effort is required to develop, disseminate and implement appropriate standards for the production and use of digital data.

Oversight of Contractors under Outsourcing. The Karnataka unsuccessful experience in the outsourcing of the task of digitising the tippan records in two Taluks to produce new village maps based on the tippan records (see page 15) and

the fact that SSLRD staff did not closely oversight the activity and then spent several years checking the contractor's output clearly demonstrates the need for changing the approach to outsourcing. Government officials should work closely with the contractor to verify work as it is produced. This will require more than simply assigning staff to the task. Staff will need incentives to work closely with the contractor. These incentives might include training and better working conditions. The government will also need to come up with a better approach to checking the output of the contractor – a better approach than to laboriously check every item of work. Some sort of sampling approach, with appropriate "checks and balances", seems logical, efficient and cost-effective.

Need to have a Clear Understanding of Desired Outcomes Prior to Commencing Pilots/Projects. There has been no shortage of projects to improve land records in Karnataka. There has been the project to computerise tippan records (page 15). There is the project to re-survey 33 villages in Maddur (page 17). Then there is the project to image tippan records (page 19). However it is clear that these projects have not been well-thought through. Most projects lack a clear statement on what is going to be achieved, fail to specify a clear timeframe and more importantly do not specify measures of success. In the case of the pilot re-survey in Maddur there are questions about the approach that has been adopted, but also about the legal status of the final result. Investment is required to address the problems with land records. However, a clear lesson is that more effort and rigor is required in designing, managing and oversighting pilots and projects. Consideration should be given to establishing a team of specialists for this task.

Undertake Re-Engineering before Computerisation. Although Bhoomi and KAVERI have been successfully implemented, both systems largely have computerised the existing manual systems. This limiting of the scope of the computerisation has meant that the changes could be implemented relatively quickly and without any major controversy. However, both systems suffer from cumbersome processes and a re-engineering will now require significant changes to the software systems. In hindsight there would have been advantages in re-engineering processes prior to computerisation.

Strong Action is required where there has been Long-Term Institutional Decay. There has been a long-term decay in the institution in Karnataka responsible for survey and settlement records - SSLRD. The agency has never been able to undertake a re-survey, although it did manage to implement a hissa survey from 1930-50. The agency was able to introduce City Survey plans from 1965 to about 1980, but these maps never covered the full urban areas and the maps and records that exist have not been maintained. The inability of the organisation to provide maps has been one of the main reasons for the increasing duplication of efforts to produce maps. The agency has also been unable to archive the settlement survey records produced by the British over a century ago. In recent years the agency has been provided funds to establish training institutes but there is little evidence that any training has been provided. Government has recently taken action to implement the recommendations of the Administrative Reforms Commission to assign surveyors in the field to the office of the Tahsildar. There has been no statement about the task to improve the overall survey and map framework in the state. In hindsight, it is clear that there would have been benefit in an earlier intervention. This earlier intervention could have provided better technical management in the agency and a strategic re-focusing of the activities and services of the agency.

Better Mechanisms are required to Share Data and Information. Although there have been recent efforts to share the cost of undertaking mapping and the creation of spatial databases (the mapping of Bangalore by NRSA and the MSDIP are examples of this), Karnataka has duplicated mapping and data systems. This duplication has real costs, both in the initial cost in the generation of the data but also in the added cost of trying to integrate the various datasets. About five years ago SSLRD suggested joint efforts to complete urban mapping in the state. Apparently there was agreement in principle, but no funding was forthcoming and therefore nothing happened. In recent years there has been a suggestion that KSRSAC be appointed the custodian of all spatial data. KSRSAC has been very active in generating datasets and has some credibility in undertaking this task, but it will require more resources and funding. A lesson from Karnataka is that clear action is required to appoint an agency with responsibility for generating and maintaining spatial data and then to provide the necessary funding to ensure that this important task is undertaken.

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Annex 1 – Terms of Reference

Computerization of land records: Building on Karnataka's experience

1. Background

Given the dilapidated state of land records in India and the treats this poses for development of the private sector and good governance, computerization of land records has long constituted a key element in the Government of India's (GOI's) strategy for the land sector. However, despite considerable efforts, and with the notable exception of a few states, progress has been slow and erratic. One of the reasons for this is that institutional and regulatory constraints greatly reduce the benefits to be obtained from computerization of land records. To help increase the benefits, the Government of Karnataka is requesting a study that would not only identify these constraints but also propose a technically and administratively feasible strategy to address the in the state. It will thus identify ways in which the accomplishments of successful computerization of land records in Karnataka can be built upon and expanded and propose a concrete mechanism for doing so. The way in which computerization of land records is being implemented in Maharashtra is significantly different from Karnataka and the Government of Maharashtra has requested to be included in the study so as to be able to draw lessons that could help it to move ahead with the necessary technical, legal, and institutional work, and also to provide a broader set of lessons that would be of great interest to other Indian states.

Doing so will yield immediate benefits for Karnataka and Maharashtra to develop strategies that would build on what has been achieved through computerization to improve the effectiveness of land administration in these states. It will be useful to other states who can draw on these examples not only to demonstrate that computerization is feasible and yields concrete benefits for a wide range of stakeholders, but also to learn from the shortcomings to adjust their own implementation strategy in light of this experience to have a clear vision of the program's long term objectives.

Given that there have already been some assessments of the benefits from the program in terms of improved transparency and accountability at the local level, the assignment will focus on challenges ahead rather than on demonstrating what has been accomplished in the past. This implies that one key purpose of the study is to identify bottlenecks and demonstrating how these affect the magnitude and the sustainability of the benefits that can be expected from computerization. At the same, the main emphasis will be to arrive, through interaction with policy makers and technical staff in each of the states and reference to international experience and best practice, at very specific and concrete suggestions on how shortcomings in the legal, technical, and administrative area can be addressed. In the case of Karnataka, this will be translated into a concrete action plan which will be discussed with the relevant authorities. If funding can be secured, this will be linked to an in-depth study that would allow to quantify the economic benefits obtained from computerization as it stands right and at the same time assess the demand for and the potential impact of the state implementing a more coherent long-term strategy in this area. Such an assessment would seamlessly lead to an actual evaluation of the impact of

implementing such a long-term strategy that would be of great interest and relevance to India and beyond.

2. Specific tasks to be performed

There is consensus that even where great progress has been made in computerization, the full potential of this measure is not realized for a number of reasons.

- First, because the system has been designed to deal with a legacy of past records, rather than a process that is being designed comprehensively from the ground up, only a small part of the potential efficiency gains from this step is being realized and huge inefficiencies and duplications in the system remain.
- Second, land records provide neither conclusive proof of ownership nor are they linked to any spatial data, leaving the potential to use them in order to reduce conflict and the undesirable characteristics associated with it almost completely untapped.
- Finally, while it may have made sense to focus on rural areas in order to establish the system and demonstrate its feasibility, there is little doubt that at this point extension of the system into urban areas can significantly increase the economic benefits.

The consultant team is expected to provide an in-depth treatment of ways that can be used to address each of these three issues in the two states and, in the case of KA, use this to develop a long-term strategy which, in discussion with the Secretary e-governance and his team, a plan of activities to be undertaken within the next 5 years in order to get closer to this goal. In doing so, the team will draw out the lessons for other Indian states, in particular the scope for building on Karnataka's and Maharashtra's experience to put efforts at computerization into a more strategic focus. A more detailed description of the individual tasks is given below:

2.1 Options to Improve the Land Records Systems

Having evolved over time and adapted to technical opportunities and operational challenges, and fundamental doubts about the possibility of computerized records ever replacing paper-based ones on a large scale, computerization of land records in a systematic fashion and with the intent of eliminating bureaucratic overlaps. As Karnataka, Maharashtra, and a number of other states have now demonstrated that the technical and bureaucratic obstacles can be overcome, it is time to think more systematically how the computerized system can help to modify existing business processes. This part of the work will do by providing an in-depth discussion of the options available for Karnataka in this respect. In doing so, it will explore, document, and make suggestions as to changes in

- the flow of data between the RTC records system in rural areas or the property registry card in urban areas, and the registries;
- possible duplicated and redundant data and processes in this system as well as the status of initiatives to computerize the registries and their implication for strategies to facilitate better access to land records and greater validity of these records that build on the model espoused by bhoomi;

- the existing structure of fees and its implications for participants' incentives for registration and different types of land use, the system's sustainability in the longer term, and the potential to obtain funding for the development of the system
- the extent to which the land administration system supports government policy and a development of land markets that will bring land to its most appropriate use;
- options for improvement (e.g. a gradual migration to a title system).

The team will document and discuss with local counterparts the requirements of such changes and, on the basis of these discussions, outline ways of implementing improvements over time. Based on an assessment of costs and benefits of different options, the funding issues associated with them, and building on discussion with the relevant stakeholders and policy-makers, the team will develop and to the extent possible agree on a long-term vision for the land administration system in Karnataka over a 10-15 year horizon and the critical path to get there. In Maharashtra, the team will provide an assessment and develop recommendations on this issue.

2.2 Spatial Framework for Land Records

Given that systematic surveys that were originally intended to ensure that the spatial information contained in land records remain up to date have not been conducted, there is a lack of correspondence between spatial and land record information. This not only makes it difficult to ascertain the completeness of the registry but, more importantly, creates problems in peri-urban areas where land values are rapidly appreciating. To deal with this issue, the team will assess the status of the spatial data infrastructure in rural and urban areas and suggest mechanisms to gradually link it to land records in a more systematic fashion. In doing so, the team will draw on existing survey data, the experience from pilots to computerize survey data and field maps in selected areas, and the status of urban mapping. It will use these to develop a strategy to link land records that have been computerized through bhoomi to spatial information over time, involving the private sector, and modern technology for surveying and mapping, as a key input into the state's longer-term land administration strategy.

2.3 Extension of Bhoomi to Urban Areas

The team will draw on the Thai and other relevant international experience to design cost-effective mechanisms that would permit the quick extension of bhoomi into urban areas where the benefits from a sound land administration system that eliminates the ambiguities, insecurity, and opportunities for corruption inherent in the present system are going to be much higher than in rural areas. This task will involve an investigation of differences in:

- the lands records management systems for urban land from the systems for rural land that have been computerized with bhoomi;
- the institutional arrangements that support these land records systems;
- in the options available for the delivery of land records information in urban areas; and
- the broad requirements of urban land markets for computerized land records systems

Using this status assessment, a plan to extend bhoomi into urban areas will be drawn up for Karnataka. This will focus on the status of land administration and how these differences must be recognized in extending bhoomi to urban areas. Based on an assessment of the advances made and remaining shortcomings with respect to urban areas, recommendations to utilize this experience will be made for Maharashtra.

2.4 Five Year Plan and lessons for other Indian states

The team will use the above to formulate a 5-year plan with specific actions and quantitative targets that could be adopted by the new government, possibly with outside support, to implement this long-term vision and expand the reach and usefulness of the land administration system. In addition, it will draw on the pilot experience of Karnataka to distil lessons in terms of processes and institutional structure as well as policy that would allow other Indian states who are currently in the process of computerizing their land records to pursue their goals more effectively and with a clear long-term vision in mind.

3. Budget and operational arrangements

These TOR are for a team of two senior land administration specialists with at least 15 years experience each to visit Karnataka for a minimum of two weeks, ideally Aug. 22 to Sept. 13. To ensure that the study meets local needs, the consultants will draw up a draft workplan which will be agreed with officials in the two states in advance of their visit. During their visit, they will liaise closely, and on a continuing basis, with the Secretary, e-governance and a counterpart team established by him in Karnataka and with a team of local officials in Maharashtra. The local team will be available for discussion will provide assistance in field visits to representative districts/Taluks. It will also provide assistance in arranging meetings with key officials and stakeholders, in Revenue Department, other government agencies including the Town Planning Authority, any Land Development Authorities, Regional Development Authorities, Industrial Development Boards, Land Use Board, City Corporations, as well as others active in the land market (judges, courts, lawyers, real estate agents, developers). The consultants will hold a seminar to present their draft report to a group of officials chosen by the Secretary.

To ensure that the best use is being made of available time, the consultant team will get access, either electronically before their visit or while in India, to copies of relevant laws and regulations, particularly those implemented in recent years and any information on any proposed new legislation. It will also have access to a collection of some basic statistics and information on things like population; land parcels (number, area, rural/urban); administrative districts (district, Taluk, villages, number, population, areas); information on panchayat at district, Taluk and village levels; information on Municipalities; extent of existing urban maps; geodetic control.

This is a lump sum contract is for a total of US $ 29,000 (which includes remuneration for the consultants as well as any necessary travel arrangements), to be paid in four installments. A first payment (of US $ 10,000) will be made upon presentation of a detailed work plan that has been agreed with the counterparts in KA and MA. A second payment of US $ 10,000 will be made upon presentation of the draft report to the relevant authorities in both states and at the national level at the end of the mission, and a fourth payment of US $ 9,000 upon delivery a final report that incorporates the comments received during this presentation as well as

any other discussions with policy makers in India and that is cleared by counterparts in both states.

Annex 2 – Copy of Aide Memoire/Minutes of Workshop

INDIA - Land Issues

Mission to Bangalore, Sept. 6-8

Aide Memoire

A team led by Klaus Deininger (Lead Economist, DECRG) and including Tony Burns, and Kevin Nettle (consultants) who had been in the state for 2 weeks, visited Bangalore on request of the Government of KA to discuss options for using the infrastructure established under Bhoomi to increase the security of property rights to land in rural as well as urban areas, thereby improving on the appalling status of land records and property cards in the state. Based on the draft report elaborated by the consultants, a summary of which had been circulated to a group of officials in advance of the workshop, the mission presented options for moving ahead to a workshop attended by the Minister on Sept. 6 (see the minutes in annex 1) and had follow-up discussions with various institutions in the sector thereafter. The mission thanks all of the officials met as well as the local team for their support and assistance and would like to extend a special thanks to R. Chawla, Special Secretary Revenue Department and his team, who provided an exceptional level of support and guidance. This Aide Memoire, which was cleared by R. Chawla, summarizes key conclusions.

The report by the consultants, elaborated jointly with the local team, provides the basic elements of a long-term strategy to use the infrastructure established by Bhoomi as an instrument for moving towards a comprehensive system of property registration. Discussions during and after the workshop revealed that both the technical conditions and the political will for doing so are clearly present. However, before it will be possible to move towards larger-scale implementation, for which the Government of Karnataka is likely to request financial assistance by the Bank, a number of technical, legal, and regulatory issues need to be explored in more detail, possibly through pilots. The mission helped to agree on the broad strategy, define these activities, and a number of specific next steps.

The mission was also informed that the GOI has just established a committee, to be convened by Mr. Chawla, to chart out a way forward for computerization of land records and property rights to land at the national level. In view of the fact that the activities to be implemented in Karnataka are likely to hold significant lessons for other Indian states, the Government requested that, over the next 12-18 months, the Bank provide technical assistance to ensure that pilot activities be carried out in a way that facilitates large-scale implementation of the long-term strategy. A request was also made for an exposure visit by technical staff and policy makers, respectively, to neighboring Asian countries to study different aspects of the solutions that are likely to be required and to enhance political support for the institutional and legal changes that will be required. R. Chawla also requested the Bank team advising Karnataka to provide technical advice to the national committee to ensure that international experience, as well as its application to Karnataka, is incorporated in these deliberations.

The mission indicated that, in addition to exploring the scope for supporting the process through its own staff to accompany the process, the Bank would approach bilateral donors (in particular DFID who had funded the current study) with a request for support to the technical assistance that is required to maintain the momentum. At the same time, it will explore opportunities to provide continued technical support and to ensure that, upon successful conclusion of the pilot activities, the required resources for scaling up could be made available.

Main conclusions from the workshop

The workshop demonstrated that officials do not have illusions about the sorry state of land records in both rural and urban areas and, more importantly, that there is a genuine willingness to collaborate across departmental boundaries to solve this problem. There was agreement that, even though in its current form Bhoomi does not provide information on ownership, it will be an ideal vehicle to move towards this goal, with an option of eventual adoption of a registration of title system. The strategies to realize this potential would differ between rural and urban areas:

In *rural* areas (i.e. with respect to agricultural land), field books or *tippans*, the legal documents that are used to spatially reference property rights, are in a state of advanced deterioration and an unknown number has been lost. This implies a need for immediate action to preserve the *tippans* by scanning them, to use computerized village maps and *tippans* to provide an index map, and to devise strategies to reconstruct those that have been lost. A second problem is that these documents often

no longer reflect reality on the ground because of unregistered or -surveyed subdivisions and transactions since the original survey in the 1860-90s (or a supplemental settlement undertaken about 1930). To address this, a strategy for dealing with cases in which the *tippan* record no longer conforms to ground realities in a systematic and cost-effective way will need to be developed. During the workshop it was agreed that Bhoomi would provide funds to immediately start scanning the about 15 million *tippans* in existence. Options for complying with the remaining two tasks were identified and the agreements reached in this respect are discussed in more detail in the attached minutes.

For *urban* areas and non-agricultural lands, the situation is much worse: property cards which are the main form of legal evidence for property ownership, exist for less than 1% of the at least 4.5 million properties and even these, generated in the 1965-80 period, have not been updated and are thus out of date. The proposed strategy for solution differs between the state's 57 main cities plus Bangalore and the non-agricultural lands and *gram khammas* of the remaining *gram panchayats*. In the former, ongoing projects are developing cartography and collect attribute information for tax purposes. This information, once it has undergone appropriate validity checks and no complaints have been lodged in an extensive process of public verification that would probably have to include tribunals to quickly resolve disputes on the spot, can be used to form the basis for an "urban Bhoomi" that would confirm urban land ownership rights on an unprecedented scale. Discussions revealed that, except for the parts of about five cities for which a city survey had been undertaken in the past, the existing legal framework does not pose any obstacle to using this information to issue new property cards which would provide legally recognized documentation of ownership rights. A similar process could presumably be followed in the *gram khammas* of other *gram panchayats*.

Immediate actions

It was agreed that, provided the funding required for the consultants can be obtained, the following actions will be performed in the immediate future.

Scanning of tippans and computerization of village maps: In addition to establishing a basis to enrich the information to be provided to rural citizens on their existing Bhoomi records, this would also save these legal documents from further deterioration and, in addition, allow a precise estimate of the number of documents that are out of date (as well as those where the required information has been lost), thereby allowing for the first time to quantify the number of unrecorded subdivisions that need to be re-surveyed and to identify where they are located. This will be crucial to identify the best technical option of tackling this issue. Bhoomi will fund the scanning of all tippans and a subset of the village maps from its own resources, possibly complemented by funds from GOI. The team would also move towards a definition of the fields that will be maintained by the revenue department, which ones would be maintained by others, and which ones would be dropped.

Definition of data infrastructure for and time plan for urban Bhoomi: As the collection of tax data for urban areas is just starting, it will be critical to ensure that all the required fields are included and transmitted to the responsible agencies. Based on the input from the consultants, and using the understanding that had been reached during he workshop, the local team will aim to obtain a memorandum of understanding with the responsible agencies that would specify the format as well as time schedule for the data to be delivered to Bhoomi.

Options for resurvey in rural areas: While existing estimates of the resources and time required for any form of resurvey differ widely, none of them is based on a thorough assessment of the available options, i.e. whether to go for a systematic survey or target just plots that had been subdivided, and which of the available technology options to use in doing so. Still, there is little dispute that, for rural areas, the required re-survey work is likely to constitute the bulk of the incremental cost of a transition towards a more inclusive and secure property rights system. To provide the basis for a more serious discussion of this issue, the consultants have elaborated a note on the options in terms of technology and will work with the local team to refine and cost these under local conditions.

Legal and institutional changes to move towards a title system: The workshop revealed that, even though there is broad consensus on the desirability of having a more secure system of property rights based on title, nobody has studied in detail the legal and institutional changes that would be required for doing so. The consultants agreed that, with assistance of the local team (and drawing in others where needed), they would put together such a note that could then be utilized not only to chart out a strategy for legal and institutional change but also to design a public information campaign (in coordination with the roll-out of Bhoomi) that would allow a substantive discussion.

Next steps

It was agreed that, provided resources and necessary clearances can be obtained, the consultants would be in contact with the local team via email and phone to advise on immediate problems in implementing the required actions. A follow-up visit by them as well as Bank staff would be planned for early January, i.e. at a time when information from all the data gathering exercises should be available, thus allowing to obtain an estimate of the magnitude of the tasks involved in scaling up the activity that would allow to jointly reach a number of decisions on strategic issues.

Annex 1

Minutes from the Workshop on Land Administration System

Sept. 6th 2004

Atria Hotel, Bangalore

Introductory remarks

In his introduction and welcome note, R. Chawla, Special Secretary (e-Governance), Revenue Department, highlighted that the goal of the workshop was to brainstorm on the five issues identified in the agenda. To do so, a number of key policy makers would present their thoughts, to be followed by a discussion issue by issue for each of which the WB team (T. Burns, K. Nettle, K. Deininger) would present findings from their review of Karnataka and options based on international experience, to be followed by general discussion.

Sri V. Gore, Additional Chief Secretary noted that there is a serious danger that the Revenue Department is taken over by non-core activities, thus losing its comparative advantage. While Bhoomi has been a great achievement, it does not confirm ownership, will need to be complemented by a spatial framework, and be linked to re-engineered systems. Even though doing so will be a long process, the alternative, especially in urban areas, is a serious threat to law and order through land-related issues such as corruption, activities by land-sharks, and other types of manipulation.

Sri L. Vallatharai, Secretary Revenue Department, highlighted that, even in rural areas, the magnitudes involved are very large and that data loss and lack of updating already constitute a serious danger. All the solutions that have been tried thus far having been rather ad hoc and not sufficiently scalable. Addressing these threats would require to scan, vectorize, and mosaic *tippans* to form a village map; verify and link them to Bhoomi; and close gaps where they exist (especially in the gram khamma). This will require significant funding.

Sri S. M. Jammadar, Secretary Revenue Department, reminded the audience that, in charting a way forward, it would be important to bear in mind the historical background under which these systems were developed. It would also be critical to consider the impact of any intervention on all types of land uses, including rural-urban conversion, the maintenance of environmentally sensitive areas (waterbodies, floodplains, pastures), and to anticipate key policy issues such as encroachment and develop strategies to deal with them within the broader context of the government's obligation to guarantee property rights.

Sri P. RaviKumar, Secretary Urban Development Department, emphasized that the institutions in the urban sector have neither the authority nor the obligation to maintain or be custodians of land records. To the contrary, land issues had come into sight only because of the need to collect taxes. The need to bring previously unassessed properties into the system led to the development of systematic surveys based on satellite imagery and with ground-truthing by the Survey of India in 57 towns, with plans for further extension. The data thus generated could form the basis for official recognition of property rights; however, any move toward this will have to be combined with wide publicity and broad public acceptance, especially if there is an intention to eventually move towards a titling system.

Spatial Framework for land rights

The presentation by the team stressed that, even though Bhoomi's successful computerization of RTCs and plans for greater access to these through village kiosks provide a good basis for Karnatka to build upon, there are also a number of challenges that need to be confronted. These include the lack of updating of the approximately 30,000 village maps and 150 lakh tippans, the fact that an unknown number of these has been lost or destroyed, and the existence of a high though unknown number of subdivisions and transfers (up to 10 lakhs) that have not been recorded. Various past initiatives to microfilm or digitize tippans or resurvey land had proved to be either too costly or too slow to provide an answer to the problem of deterioration that could seriously undermine the basis for the land administration system in rural areas. Therefore, more immediate measures to save existing records may be needed. A number of options for doing so (scanning of parcel maps), linking them to village maps and Bhoomi are available. While a full resurvey might be the best option from a merely technical point of view, ways to obtain the needed information more quickly, selectively, and cost-effectively in response to specific problems (e.g. conflict or clearing a backlog of subdivisions) will need to be found. Criteria to prioritize areas for resurvey (e.g. where land use has changed rapidly, conflict is high, or original records have been lost) and to use technology may be needed.

The presentation led to animated discussion on the various options to computerize the survey and map records that support the RTC for agriculture lands. The Director SSLRD also stated that the SSLRD estimates for re-survey of the whole state was Rs 800 crore and that it would take 12-15 years. It was generally agreed that it was difficult to justify a full settlement survey and other options such as a Hissa survey to pick up sub-divisions only, or a survey to map public land were mentioned. The Director of Survey, Settlement and Land Records noted that SSLRD planned to conduct hissa survey in one Taluk per district next year (27 Taluks). There was much discussion on the value of geo-referencing the map data, particularly from the key technical groups (Survey of India and KSRSAC).

It was agreed that the *tippan* record should be scanned as early as possible to prevent further deterioration. There also was agreement on the value of scanning the village maps, vectorising the maps, updating for phodi surveys that are not mapped and linking this information to Bhoomi to form an index map and a strategy to do so should be elaborated. Finally, technical options to resurvey and update the spatial data in rural areas should be systematically identified, evaluated and costed in light of existing experience and needs on the ground. The goal would be to establish a menu of options to provide updated spatial data for different types of situations, field test them, and then elaborate a strategy where the Revenue Department deploy them in response to specific needs and in a coordinated manner. The Secretary e-Governance offered to fund the scanning of tippan records from Bhoomi revenues and to take the other items forward by forming a smaller working group that would periodically report to the Minister.

Lack of Spatial and Attribute Data in Urban Areas

The presentation stressed that the maintenance of land records for non-agricultural areas varies widely, which makes it near impossible to integrate them, and causes large gaps (e.g. in gram khammas). In the main cities, land records (property cards) are to be maintained by city survey offices while village accountants are responsible for maintenance of land records for non-agricultural lands in other areas. The fact that these arrangements do not work has prompted municipalities and the BMP to embark on a separate exercise to re-survey of properties for tax purposes without claiming to provide or generate any information on ownership. Some smaller gram panchayats use a systematic self-assessment by property holders, without any link to spatial data.

In the discussion, the Director of Town Planning (DTP) indicated that, under an ADB project, DTP aims to create new maps for 20 cities using aerial photography and that for 13 cities, photography had been completed while mapping was complete for Bangalore and Mysore. The Survey of India stated that it had a program to produce 1/1,000 scale mapping of cities from high resolution satellite imagery and that it would be important to geo-reference survey data. The representative from Janaagraha noted that the collection of data in cities had to look not only at ownership information but also the supply of services and that pilots should be started to get things going. It was noted that the Gram Panchayat also were keen to have mapping as a means to improve their records of tax payers, something which alone could justify action towards this end.

There was general support for the proposal for the Revenue Department to build on the spatial data generated by DMA and BMP instead of trying to conduct its own surveys. The latter agreed that they would make their data available to the Revenue Department for this purpose. It was also agreed that the Revenue Department would coordinate with DMA and BMP to link their plans to provide extracts to property owners in urban areas to the longer-term strategy for developing an “urban Bhoomi”. The various approaches adopted by gram panchayats should be evaluated more systematically with a view towards their cost and replicability as an input into a strategy towards closing the gap between rural and urban lands and for Revenue to collaborate with local governments on improving their property data base.

Re-engineering Bhoomi

The presentation emphasized that, even though it has helped to make information more accessible and eliminate petty corruption, Bhoomi has just computerized an existing paper-based process which has remained essentially unchanged since it was introduced in the late 19th century and that could be considerably simplified by building on the technical advances made in the interim. For example, even under Bhoomi, the mutation process remains cumbersome, a VA’s signature is still required, implying that the scope for political interference may not be completely eliminated, and the fact that a large number of data that are not directly related to ownership are carried along increases the cost. On the other hand, some encumbrances that should be included in a land record (e.g. irrigation easements) may not be captured right now.

The Secretary of Revenue noted that the Department was already taking action to modify Bhoomi in line with user needs, e.g. by generating a link between Bhoomi and KAVERI. It was also pointed out that significant effort would be required to validate the data entered into Bhoomi in urban areas. It was recognized that Bhoomi could provide a lot of value for land use planning but agreed that a strategic decision needs to be made on whether it is the most appropriate vehicle for such an effort.

A study of the current and future users of Bhoomi (RTC), to identify a core set of data that needs to be captured, and to propose strategies for capturing and making available, possibly on a cost recovery basis, other data that are currently included in the Bhoomi database will be undertaken by the Revenue Department. The Revenue Department will also explore possibilities to improve connectivity, especially with sub-registries and making Bhoomi information more widely and publicly available. Building on the link between Bhoomi and KAVERI as well as experience of automating mutations in other states, to simplify processes and suggest potential institutional changes that could be facilitated by more fully exploiting existing technology will be explored. Finally, based on available data from DMA and BMP and a time plan for the completion of the effort, the Revenue Department will develop a strategy for systematic validation of these data and the content and implementation of a "urban Bhoomi".

Lack of conclusiveness of land rights

The presentation noted that the current land administration system is neither comprehensive nor conclusive, fails to ensure validity, is not supported by maps. In fact, the inordinate attention given to verifying the identity of the transacting parties is in stark contrast to the minimal description of the land that is transacted. Also, the requirement of extensive searches increases costs. It was noted that, while a full resettlement survey followed by issuance of title is unlikely to be feasible, a viable alternative would be an incremental approach that is based on the best available information from a re-engineered Bhoomi and issue them as provisional titles, subject to maturation over the period (12 years in the case of India) in the statute of limitations. This would mean that all those documents against which no dispute has been registered during the first 12 years of their existence would automatically constitute valid titles In fact, this approach has been taken by a number of other countries, especially in the context of switching from a deeds to a titling system. While a title would not necessarily have to come with a state guarantee (or could guarantee only parcel identity but not precise measurements or boundaries), the desire to move towards it would clearly have implications for the future of Bhoomi and other institutions dealing with land.

The presentation led to a very lively discussion in which both the pros and cons of a state guarantee for property rights and different options for establishing a title registration system in Karnatka were considered. While those present reached a general consensus on the desirability of moving towards a titling system, it was noted that a broader public discussion of the issue, possibly linked with an information campaign, would be required. Also, it was noted that the decision could not be divorced from the mechanisms used to get there. The option of using best available evidence generated a large amount of discussion, focusing on (i) the responsibility of the State in protecting ownership; (ii) the extent to which the State should guarantee title; and (iii) the handling of disputes arising from the issue of title. There was general agreement on the responsibility of the State to guarantee property and the need for a more integrated and comprehensive parcel-based system. It was also noted that the transition to registration of title would offer a number of additional advantages. While many of the steps identified earlier could contribute towards this goal, it was recognized that further debate on this topic would be needed and should be facilitated by the Revenue Department. The consultants agreed to produce a short background note on legal and institutional issues to be considered in such a transition and the time frames involved to facilitate such a discussion.

Single Agency for Land Administration

The current system of land administration, with stamps and registration, the ROR, the SSLRD, as well as corporations, municipalities, and panchayats as major players, is characterized by high complexity that results in lack of clarity, costly duplication of efforts, and a resulting lack of consistency in records. It would be desirable to merge the recording, survey, and mapping functions into a single agency and to focus activities more sharply on land administration and provide a one-stop shop that would allow potential users much easier access to a consistent set of land administration information.

There was agreement on the problems created by the current situation of multiple systems and agencies, together with the option of merging the land administration functions of Revenue Department, SSLRD and IGRS to create a single Land Administration Agency. There was no dissent with this proposal and in fact it was pointed out that things were already moving in this direction with

the linking of Bhoomi and KAVERI and the pending integration of the survey maintenance functions of SSLRD with revenue Department. It was pointed out that even once institutions are merged, it will be necessary to review and streamline the processes involved, and that such a review should be undertaken as soon as the details of the planned merger have been clarified.

Summary of action points

For ease of reference, the agreements reached are summarized below:

- The *tippan* record should be scanned as early as possible to prevent further deterioration. There also appears to be value in scanning the village maps and linking this information to Bhoomi to form an index map. A strategy to do so should be elaborated.
- Different technical options to resurvey and update the spatial data in rural areas should be systematically identified, evaluated and costed in light of existing experience and needs on the ground to provide the basis for a more informed decision on how to move about selective re-surveys.
- The Revenue Department should build on the spatial data generated by DMA and BMP instead of trying to conduct its own surveys. The latter agreed that they would make their data available to the Revenue Department for this purpose and to coordinate efforts to provide extracts to property owners as a first step of verification.
- The various approaches adopted by gram panchayats should be evaluated more systematically with a view towards their cost and replicability as an input into a strategy towards closing the gap between rural and urban lands and for Revenue to collaborate with local governments on improving their property data base.
- A study of the current and future users of Bhoomi (RTC), to identify a core set of data that needs to be captured, and to propose strategies for capturing and making available, possibly on a cost recovery basis, other data that are currently included in the Bhoomi database will be undertaken by the Revenue Department.
- The Revenue Department will explore possibilities to improve connectivity, especially with sub-registries and making Bhoomi information more widely and publicly available.
- Building on the link between Bhoomi and KAVERI as well as experience of automating mutations in other states, to simplify processes and suggest potential institutional changes that could be facilitated by more fully exploiting existing technology will be explored.
- Based on available data from DMA and BMP and a time plan for the completion of the effort, the Revenue Department will develop a strategy for systematic validation of these data and the content and implementation of a “urban Bhoomi”.

The Secretary e-Governance offered to take these issues forward by forming a smaller working group that would periodically report to the Minister.

Conclusion

For the World Bank, Klaus Deininger thanked the Department of Revenue for organizing this workshop to bring together all of the main stakeholders in a highly and all the participants for their contributions and willingness to put aside traditional institutional barriers in the interest of providing greater security of property rights to land and making the institutions dealing with these rights more efficient and effective. He appreciated the strides Karnataka has made and the scope this provides for other Indian states, as well as the lively and open discussion at the workshop and indicated that the World Bank would consider any request for further technical or financial assistance to help this process forward. Following a note of thanks by G. Sathyavati, Deputy Secretary (e-Governance), the workshop was closed by M.P. Prakash, the Hon. Minister for Revenue and Parliamentary Affairs.

List of participants:

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5	Mr. P.RaviKumar	Secretary	Urban Development	22353942	
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8	Mr. S.M. Jamdar	Secretary	Revenue	22252731	
9	Mr. Lukose Vallathrai	Secretary	Revenue		
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15	Mr. Krishna Kumar	Planning Officer	JDT	22975590	
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22	Mr. Mukund		Bangalore Development Authority		
23	Mr. Ramu	Consultant	Survey of India		
24	Mr. GuruMurthy	Shiresthedar	Bhoomi Monitoring Cell	22355174	
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Annex 4 – Legal Status of Urban Bhoomi

The proposed option for extension of Bhoomi to urban and non-agricultural areas is by using records developed by the local authorities. If that is done urban Bhoomi would then be a useful land information system but may be lacking in legal status. Its legal status would be dependent on the Land Revenue Act, 1964 and the Land Revenue Rules, 1966. The following provisions of the Land Revenue Act and Rules are relevant:

Land Revenue Act, 1964

Section 152, which provides that, if the State Government at any time deems it expedient to direct a survey of any land within the site of any village or the limits of any city or town such survey shall be conducted in accordance with Chapters IX and XII of the Act. (These Chapters deal with surveys and determination of boundaries.)

Section 153, which provides that when a survey is ordered under S.152 within a city or town containing more than 5,000 inhabitants –

(a) a notification shall be published inviting persons having an interest in the land to attend for the purpose of supplying information;

(b) each holder of a building site shall be liable to pay a survey fee.

Section 154, which provides that the holder of a building site for which a City Survey is carried out under S.152 is entitled to receive a certificate in the form prescribed specifying the plan and description and the extent and conditions of his holding.

Land Revenue Rules, 1966

R. 82 Survey of building sites in the limits of any Village, Town or City, the boundary of which has been determined under S. 148 shall be by theodolite traverse system for the preparation of a framework for the detailed survey work and by Plane Table for the building sites.

R. 83 When building site determined under S. 152 the following records shall be prepared:

(a) enquiry registers showing the details, such as the name of the holder, area of the building site, assessment etc.

(b) register of encroachment cases;

(c) register of unauthorized conversion cases;

(d) register of building sites (ie. Property cards or registers in Form 13)

(e) certificate of building sites;

(f) register of certificate fees.

R. 86 The certificate to be granted under S. 154 shall be in Form 9.

R. 88 On receipt of changes in the rights over building sites ……..

(a) through intimation slips from the Sub-Registrar, or

(b) by virtue of orders of superior officers, or

(c) due to changes notices during inspection by the City Surveyor,

(d) the City Surveyor shall effect mutations in property cards or property registers.

R. 89 After the mutation is effected in the property cards or registers, notice to be given in accordance with S. 129(2).

For the urban Bhoomi to have legal status it would have to be regarded as the property card record and this would seem to be the best objective. It is clear that, as a matter of law, property records may be kept by the Revenue Department where the land is a building site which has been the subject of a survey under S.152. So, the question is whether lands, the information for which has been initially collected by the local authorities, can be regarded as the subject of a survey under S.152. If the responsibility of the City Surveyor can be delegated to the Municipality or Corporation it would seem possible, subject of course to amendment of R.82.

However, it has been proposed to amend the Revenue Act Rules to include a new Chapter XIIA dealing with Record of Rights in cities, towns and villages and a draft has been prepared. Rule 93-C authorizes the City Surveyor to prepare the record of rights based on the best available evidence from household enquiry and property tax records. This amendment is obviously more in step with the proposed approach to creating urban Bhoomi. But it still raises a question as to whether the City Surveyor must carry out the survey or whether it can be carried out by the Municipality or Corporation.