

REVENUE DEPARTMENT

3.3 Computerization of Land Records and Cadastral Maps

Highlights

- In the absence of individual maps of sub-divisions/surveys and interface between Dharani and Cadastral Maps, copies of maps could not be issued to public instantaneously and public had to approach Director of Settlement and Land Records (DSLRL) for maps and Mahiti Ghars or Mamlatdar offices for Records of Rights (RoR) copy separately.

(Paragraph 3.3.5.3)

- Partitioning of a sub-division into two sub-divisions with larger area than the original area was possible due to faulty system design.

(Paragraph 3.3.6.5)

- Lack of input controls and validation checks resulted in incomplete and incorrect data base leading to pendency of mutation requests and mutation of properties having other rights like mortgage, general power of attorney etc.

(Paragraphs 3.3.7.1 to 3.3.7.3)

3.3.1 Introduction

The Government of Goa took up two schemes viz. Computerisation of Land Records (Dharani Project) and Digitisation of Cadastral Maps for automation of land records.

a) Dharani Project

Computerisation of Land Records, named '*Dharani*', was taken up in April 1999 and completed by November 2001 at a cost of Rs 78.90 lakh. The entire cost of the scheme was met through financial assistance from Government of India under Computerisation of Land Records scheme. The programme was developed by National Informatics Centre (NIC) with SQL¹ Server 2000 as the back end tool, Visual Basic 6.00 as the front end tool and Crystal Report-7 as the Reporting tool. It was designed to work on Windows platform. Two personal computers and one printer were procured for each Mamlatdar² office for implementation of the scheme. The data for the State was stored on a central server and updated from local servers installed in Mamlatdar offices.

The scope of work envisaged data entry of Form I and XIV³ into the system to create a central database, linking of all Mamlatdar offices to the central server so that Records of Rights (RoR) could be issued from any office. The Mahiti

¹ Structured Query Language

² Head of Taluka Revenue office.

³ Form I and XIV represent the basic Record of Right. Form I gives details about Owner, Tenant, Other Right Holders, Type and Area of Land, etc. Form XIV gives details about cultivators, crop, source of irrigation, etc.

Ghars⁴ set up in January 2004 by a private agency for providing services such as issue of RoR, birth and death certificates, motor vehicle licenses, etc. to public were also to access data from central server for issue of RoR. It was also envisaged to automate mutation process.

The benefits envisaged from the computerisation were:

- Safe storage of records and space saving, better security of records by reducing the possibilities of tampering and manipulation;
- Maintenance of up-to date land records on computers accessible to land holders and administrators, including issue of RoR of any taluka at any office;
- Speeding up of the mutation process by providing required monitoring information on line;
- Promoting accuracy of records and minimizing errors;
- Availability of various statistical reports like Types of Land, Area and Ownership as and when required;

As on date (June 2007), the people are able to get the extracts of RoR of land situated in a taluka from the respective Mamlatdar office or from any of 13 Mahithi Ghars operating in Goa. The mutation process has been automated. However, the system suffers from deficient controls and the envisaged benefits are yet to be realised fully.

b) Digitisation of Cadastral Maps

Digitisation of cadastral maps of Tiswadi taluka was taken up in August 1999 and completed in October 2001 under Centrally Sponsored Scheme of Computerisation of Land Records. On successful completion of a pilot project in Tiswadi taluka, scheme was taken up in balance ten talukas and completed in 2005. The total cost of the scheme was Rs 5.34 crore of which Rs 75 lakh was received from Central Government and the balance cost was met by the State Government. The work of digitisation of cadastral maps was entrusted to M/s Vision Labs, Hyderabad (firm) and the software used was Vision Mapmaker (VMP) on Windows platform.

The scope of the project was to create village maps using VMP software and to integrate individual land holding and survey data with computerised cadastral maps so as to ensure availability of the maps of individual survey numbers to public on request.

3.3.2 Organizational Set-up

Director of Settlement and Land Records (DSLRL) was the nodal Officer for implementation of both the schemes. Collectors at district level and

⁴ Kiosks set up by e-Thinx Infocom Private Limited, a private agency

Mamlatdars at the taluka level were the implementing authorities. “Talathis⁵” were responsible for up to date maintenance of land records within their jurisdiction under both manual as well as computerised system. The Mamlatdars supervise the work of Talathis and are the main functionaries maintaining all types of land records pertaining to a taluka. The responsibility for maintenance of the systems installed at Mamlatdar offices vested with the concerned Mamlatdar/Collector. The NIC maintains the central server at the Secretariat. DSLR maintains the systems installed in DSLR office and its five sub-divisions for cadastral maps.

3.3.3 Audit objectives

Audit of the scheme was done to evaluate:

- (i) Extent of Computerisation of land records and cadastral maps including their integration.
- (ii) Efficacy and effectiveness of controls relating to:
 - Planning and Organisation of computerization of land records
 - Acquisition and implementation of IT facilities
 - Delivery and support
 - Monitoring.

3.3.4 Scope of Audit and Methodology

The IT Audit was conducted during June – July 2007 by review of records at DSLR, working of systems (both Dharani Project, i.e. Land Records Information System (LRIS) and Digitisation of Cadastral Maps) at five Mamlatdar’s offices⁶, Office of Director of Settlement and Land Records and three Sub-division offices⁷ of DSLR. The audit process included:

- discussion with officials of DSLR, five Mamlatdar offices and representatives of National Informatics Centre (NIC) as well as Vision Labs (firm);
- review of files pertaining to receipt and utilisation of grants, procurement of hardware, software and related accessories.

Audit Findings

A review of files, working of the system, dummy data entry and analysis of data as regards systems implemented disclosed various shortcomings as detailed below:

⁵ Official responsible for maintenance of basic data of village.

⁶ Tiswadi, Canacona, Quepem, Pernem and Bardez

⁷ Quepem, Margao and Bardez

3.3.5 Planning and organization

3.3.5.1 Non-involvement of users

The User requirements need to be clearly defined before development and implementation of any system. However, it was observed that no such requirements were finalized and properly documented. In the absence of proper documentation, the requirement could not be updated even after five years of implementation. As a result, the system designed by NIC either did not meet the requirements fully or did not help in optimization of the benefits of computerisation as detailed in paragraph 3.3.6.

3.3.5.2 No records were available with DSLR to indicate the testing and demonstration of working of Application software.

The Department replied (October 2007) that testing and demonstration of working of application software would be formally recorded for all subsequent projects.

3.3.5.3 Interface between Dharani and Cadastral Maps

It was envisaged to integrate the data of cadastral maps with that of RoR database. Each map had more than one survey and several sub-divisions while details of each sub-division have been captured separately under RoR database. As such there was no individual map available in respect of each sub-division. At present, the individual maps were being created at the DSLR with manual intervention each time. Therefore, public could not be issued the copies of maps through Mahiti Ghars and Mamlatdar Offices where RoR were issued. The integration could have provided single window public service in respect of RoR and maps. Thus, one of the envisaged objectives i.e., easy and instantaneous availability of correct record to the public was yet to be achieved as it was taking at least three days for issue of maps. Further, since the cadastral maps had to be edited manually to prepare extract of the concerned survey number and sub-division, the system was prone to errors and was time consuming.

The Department replied (October 2007) that efforts were being made to achieve integration.

3.3.6 System Design

Dharani Project

3.3.6.1 The system design provided four digits only in respect of data entry of survey number. The data entry was done by private parties and it was certified (June–July 2000) that data entry was complete in all respects. However, later (June 2005) it was noticed that some survey numbers were having five digits and there were some difficulty in entering such data. The fact that this system deficiency was noticed after almost three years of full

implementation indicated lapse on the part of Department in communicating the user requirements and in checking the data entered into the system for completeness before certifying. Thus the data entered was also not reliable.

3.3.6.2 Absence of provision in the system to capture the prescribed fees⁸ for issue of forms relating to RoR resulted in manual reconciliation between RoR issued and amount collected.

The Department replied (October 2007) that the web-enabled version (Dharani II) would have a full fledged accounting system with regards to issue of Form I & XIV by various agencies.

3.3.6.3 System did not provide for allotting unique number to identify the owner of the land so as to generate reports regarding total land held by a single person throughout the State.

3.3.6.4 Form XIV of RoR gives the details of cultivators, crop, source of irrigation, area irrigated, etc. On request, NIC had proposed uniform codification of season, crops, land type, etc. The same was not accepted in respect of Form XIV on the ground that the form manually was not uniform in all the villages. NIC opined that as data without standardization would be not amenable to analysis, it would be better to scan and store the source documents in electronic form instead of data entry of the same. But, the data entry regarding Form XIV has since been completed. This made the data in Form XIV totally unreliable.

3.3.6.5 System did not have provision to capture the balance area automatically after entering the area of the new sub-division created as a result of Partition and the same has been entered manually. The system even allowed entry of area more than the original area held. This indicated deficiency in system designing. The Department replied that this has been taken care in Dharani-II.

3.3.6.6 Mutations were being carried out in all the 11 Mamlatdar offices and corrections to mutations are carried out at DSLR as well as in sub-division offices. The data available in the local server at Mamlatdar offices were being uploaded to the Central server on an hourly basis. The changes made to the data in either sub-divisions or DSLR were being updated in DSLR or sub-divisions respectively through compact disks. Thus two parallel sets of data were being maintained. As Mahithi Ghars were accessing RoR data from central server and the updations were being carried out in the central server after a time gap, risk of issuing non updated RoR to the public persisted.

3.3.6.7 Though the User Manual prepared by NIC indicated about scanning facility in respect of documents such as applications, supporting documents like gift/sale deed, will, court order and proofs of serving notices, objections etc. for future verification purpose, the developed system did not contain such provision resulting in preservation of such information in manual hard copies.

⁸ Rs 10 for the first sheet and Rs 5 for each additional sheet

Cadastral Maps Project

3.3.6.8 The cadastral maps were available in the form of plane table sheets. The extracts of cadastral maps of individual land holdings were issued by copying and modifying the relevant portion from the concerned plane table sheets. Necessary corrections are carried out in the plane table sheets in respect of approved mutations. The plane table sheet as modified by the data entry operator and further approved by the verifying officer and the certifying officer would replace the original plane table sheet in the data base. It was observed that the system had no provision for effecting corrections by verifying officer and certifying officer after the modification done by the data entry operator. In order to correct the errors, if any, the incorrect version had to be approved and then the whole exercise had to be repeated. Thus the system made approval of an incorrect version of cadastral map mandatory. This rendered the data on cadastral maps unreliable, since manual control in revising the incorrect version still existed.

The Department replied (October 2007) that instead of allowing corrections through the system, the verifying officer and certifying officer could instruct the operator to carry out the necessary corrections.

The reply is not acceptable as this would compromise the control through segregation of duties between the operator, verifying officer and certifying officer.

3.3.7 Input and Validation Controls

Input and validation controls over input are vital to the integrity of the system. These controls are important for preventing incorrect and fraudulent data from being fed. Adequate input and validation controls ensure that the data received for processing are genuine, complete, correct, not duplicate and properly authorised. The following deficiencies were noticed due to lack of input and validation controls:

Dharani Project

3.3.7.1 The survey number could not be left blank. Analysis revealed that three survey numbers in Pernem Mamlatdar office and 117 sub-divisions in four⁹ talukas were indicated as '-'. As a result, mutation could not be effected in five cases received during the period from July 2003 to July 2006 as the system did not allow mutation without survey numbers.

Failure to ensure data validation through input controls resulted in merely entering the data as was in the manual system without analyzing the after effects. Thus, the mutation requests were pending as manual mutations were stopped after computerisation.

⁹ Bicholim (1), Canacona (2), Ponda (3) and Pernem (111)

3.3.7.2 There was provision to enter the nature of rights like mortgage, general power of attorney etc. a particular person held over the property. Such properties should not be taken up for mutation like the land without rights. However, the system allowed mutation of those properties which had rights on them. Data analysis indicated that the nature of rights was not entered in 1,89,427 (98.25 *per cent*) out of 1,92,792 records.

It was noticed that

- The data relating to nature of rights in the balance cases was not uniformly codified.
- Irrelevant information was stored in the database thus reducing the usefulness of the data. For e.g., details of property such as hut, well etc. were entered in the field relating to Other Rights and Tenants.
- The names of the persons holding Other Rights were not entered in 1531 cases and the names of tenants were blank in 1078 cases thus making the data base unreliable.

The Department replied (October 2007) that necessary checks would be added in DHARANI-II.

3.3.7.3 The land was classified generally as private land, forest (Government), forest (Private), comunidade land, government land, land belonging to religious institution, etc. It was observed that out of 7,94,066 records, land type was blank in 7,89,850 records (99.47 *per cent*). This resulted in non-availability of vital information useful for planning for various purposes such as land acquisition for Government purposes, restriction on transfer of ownership, land use, etc. For example, possibility of further mutation by the original owner in respect of land acquired by Government in July 2005 could not be ruled out since these lands were yet to be transferred in the name of the Government.

The Department replied (October 2007) that efforts would be made to update the data.

3.3.7.4 Though the system provided for entering the details of area of cultivable land, irrigated area, un-irrigated area, source of cultivation, details of assessment and tax collected etc., the same had not been updated. Earlier in the manual system, Talathis were responsible for collection of such information. Consequently, the Government was deprived of vital data useful in decision making.

The Department replied (October 2007) that periodical updation of the data would be taken up.

3.3.8 Logical and Physical access controls

3.3.8.1 Though the logical access to the data was restricted through biometric devices using finger prints and passwords, no review of the logs was made on a regular basis.

The Department replied (October 2007) that this would be taken care in Dharani-II.

3.3.8.2 Though the external devices viz. CD drive and floppy drives in the computers at Mamlatdar Offices were disabled, the users could enable them thus rendering the systems prone to risk of loss/corruption of critical data through virus and malicious software.

3.3.8.3 The entry to EDP room was not logged. The logged on systems left unattended were vulnerable to all kinds of risks like tampering of data.

3.3.9 Lack of business continuity planning

3.3.9.1 Though the software was developed by NIC and implemented in November 2001, the data and the source code were still under the custody of NIC. In the absence of qualified personnel, on line help in the system, the Department still depended on NIC. Further, no service level agreement with the NIC for confidentiality, security and availability of the data to the user has been made. Hence, the business continuity of LRIS was not ensured.

The Department replied (October 2007) that this would be taken care in Dharani-II.

3.3.9.2 No fire safety equipments, air conditioners were provided. Further, the systems were not covered under any maintenance contract so as to facilitate regular and preventive maintenance. The Uninterrupted Power Supply systems were also found not working in five Mamlatdar offices and three sub-divisions of DSLR test checked. Thus the business continuity of the LRIS was not ensured.

The Department replied (October 2007) that a proposal regarding replacement of UPS with online UPS was under consideration of the Government.

3.3.10 Assessment of performance and customer satisfaction

No periodical monitoring and evaluating mechanism in respect of Services delivered was available. It was observed that for issue of copies of cadastral maps, the computerised system did not reduce the time taken (three days in manual set up). No assessment of customer satisfaction was carried out. Therefore, the deficiencies in the system continued to exist.

3.3.11 Other points of interest

Awarding of contract at extra cost - Cadastral Maps Project

The pilot project of Digitisation of cadastral maps in Tiswadi Taluka was awarded (January 2001) at the rate of Rs 2,600 per plane table sheet. On successful completion of the project, balance work in respect of ten talukas was awarded (November 2001) to the same firm at the higher rate of Rs 3,700

per plane table sheet. Awarding of balance work without negotiating with reference to the old rate resulted in extra cost of Rs 1.36 crore (at Rs 1,100 per sheet for 12,353 sheets).

The Department replied (October 2007) that about two years had already passed since the original proposal of the pilot project when extended and inflation had to be taken into consideration. Further, software had to be modified to suit the requirements of the Department and to rectify the deficiencies faced during the pilot project.

The reply is not acceptable as the software remained the same and the issue of deficiencies should have been resolved in the pilot project itself.

3.3.12 Conclusion

The computerisation of land records was completed in November 2001. People can get the extracts of RoR of land situated in a taluka from the Mamlatdar office of that taluka or from any of Mahiti Ghars operating in Goa. However, the system suffers from a number of control weaknesses. The system has the risk of manipulation in mutation in the absence of details of persons holding rights on a property and allowing the mutation process to be completed even without receipt of documents. In the absence of integration between Dharani and Cadastral Maps and interlinking of data bases at root level, the benefits envisaged from computerisation (such as issue of RoR from any Mamlatdar office; issue of Maps from the Mamlatdar offices and availability of statistical reports) were yet to be realised fully and making the process of getting RoR and respective Maps a time consuming one.

3.3.13 Recommendations

Dharani Project:

- Necessary controls to be built in to disallow mutation in the absence of all required documents.
- Proper controls may be built in during modification of data during the partition such that the total of areas of new sub-divisions is equal to area of land before partition.
- Data for statistical reports such as details of cultivation, tax collected etc. should be entered and updated from time to time.

Cadastral Maps Project:

- Sub-division wise database facilitating interlinking of two databases should be created.
- Copies of maps should be made available instantaneously to people from any Mahiti Ghar or Mamlatdar office.