## REVENUE DEPARTMENT

### 3.3     Computerization of land records in Uttar Pradesh

*The scheme of computerization of land records (CLR) in Uttar Pradesh was initiated in 1988-89 with a view to overcome inherent problems in the manual system of maintenance and updation of land records. The scheme was implemented only for the land covered under Uttar Pradesh Zamindari Abolition and Land Reforms Act, 1950. It was, however, not complete even after lapse of 18 years.*

### Highlights

**Access controls were weak and Business Continuity Plan and Disaster Recovery management was not in place.**

**(Paragraph 3.3.6.4)**

**On- site training to officials was incomplete in 39 districts.**

**(Paragraph 3.3.6.6)**

**The information stored in the database was full of errors and important details were missing in the computerized database, thereby, compromising reliability of 'Record of Rights' to land holders**.

**(Paragraph 3.3.7)**

**Mutation orders were being updated with delays and not within prescribed time limit.**

**(Paragraph 3.3.8.1)**

**Due to inconsistencies in database design and structure of table in different tehsils, it is difficult to integrate data for generation of Management Information System (MIS) reports for planning and development purposes.**

**(Paragraph 3.3.10)**

### 3.3.1     Introduction

The scheme of Computerization of Lands Record (CLR), a Centrally sponsored scheme of the Government of India (GOI) was initiated (1988-89) with a view to overcome the inherent problems in the manual system of maintenance and updation of land records and to provide computerized land records to land holders. Initially, the scheme was launched in 1988-89 as a pilot project in Deoria district and subsequently all the districts were covered by July 2005. Uttar Pradesh Record of Right (Computerization) Rules-2005 (Computerized ROR rule 2005) was notified to accord legal sanctity to computerized RORs for all purposes and issuance of manual RORs was stopped. A client server model application (*Bhulekh*) was developed by National Informatics Centre (NIC) with Visual Basics at the front end and MS-SQL server at the back-end.

The objectives of the scheme were to:

- facilitate easy maintenance and updating of land data base;

- make the land records tamper proof which was expected to indirectly reduce the menace of litigation and social conflicts associated with land disputes;

- facilitate detailed planning in the area of infrastructure development and environmental development; and

- provide database for agriculture census.

### 3.3.2 Organisational set-up

Board of Revenue (Board) is the State Level Implementing Authority. District Magistrate (DM) assisted by Additional District Magistrate and Chief Revenue Officer at District level and Sub District Magistrate (SDM) assisted by Tehsildar and Registrar Kanoongo (RK) at tehsil level are responsible for implementation and smooth running of the scheme within their jurisdiction.

### 3.3.3 Audit objectives

Audit of the scheme was carried out to assess whether:

- Issuance of khatauni (RORs) to land holders was accurate and reliable;

- Training was imparted to personnel effectively;

- Good practices of Information Technology (IT) governance along with controls built in to ensure data integrity, security of data, systems and other IT assets were adequate; and

- The system was efficient and effective and was designed to achieve the stated objectives.

### 3.3.4 Audit criteria

Following were the audit criteria:

- Scheme guidelines issued by GOI;

- Provisions of UP Zamindari Abolition and Land Reforms Act, 1950 (UP ZA & LR Act);

- UP Land Revenue Act, 1901 and UP Land Record Manual; and

- Good practices of IT governance.

### 3.3.5 Scope of Audit and methodology

The documents relating to various stages of system development life cycle such as feasibility study, user requirements, data flow charts of IT system etc. were not furnished to audit, thereby limiting the scope of the IT audit to scrutiny of files, records, information, Software Requirement Specification (SRS) and User Manual furnished by the Board and data retrieved and reports generated from the IT system. Field inspection of the Board, one district headquarter (Allahabad) and 11 tehsils[1] was conducted during May to August

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[1] Malihabad, Mohanlalganj (Lucknow), Sandila, Sawaijpur (Hardoi), Biswan, Laharpur (Sitapur), Kadipur, Musafirkhana (Sultanpur), Bilsi, Gunnaur (Budaun) and Mohammadi (Lakhimpur Kheri).

2007. Further, database of 18 tehsils[1] out of 305 tehsils was scrutinized/ analysed Centrally using MS-SQL server.

*Audit findings*

### 3.3.6    General Controls

### 3.3.6.1    IT strategy and policies

The Board initiated the process of computerization in 1988-89; however, no IT strategy was prepared. A Steering Committee/ Task Force was constituted at a later stage (September 2004) but without well defined role in implementation of the scheme.

### 3.3.6.2    Delayed and partial implementation of the scheme

Data entry for land records database was started in 1995-96. Subsequently, data was updated in 2004-05 to operationalize the scheme. The Board decided (September 2004) a time frame for computerisation of various activities under the scheme like 'ROR' by October 2004, computerization of mutation by January 2005, automatic generation of Jamabandi and Khasra from Computerised ROR by June 2005, automatic generation of new ROR by June, 2005, digitisation of maps by March 2006, layering of Maps on ROR by June 2006 and hoisting of maps and ROR on net by September 2006. However, none of these except computerization of ROR, that too only for ZA land[2], could be computerised as of November 2007. On being pointed out, the Government stated (November 2007) that necessary software to computerize non-ZA land[3] was being prepared by the NIC. However, Government could not specify target dates for completion of other activities.

### 3.3.6.3    Lack of Documentation

The Board and NIC did not follow the System Development Life Cycle (SDLC) methodology and developed the software merely on the basis of discussions held with the Board. The documentation relating to URS, data flow chart, input/ processing/ output requirement definition, change management control and data conversion was not available with the Board. The SRS required to be prepared before development of software was prepared (January 2005) along with the software version 1.2 by NIC that too without any authorisation. No documentation regarding formal acceptance of the software was available.

The Government accepted (November 2007) that software was developed on the basis of discussion.

### 3.3.6.4    Lack of Business Continuity Plan (BCP) and Disaster Recovery

**Business continuity plan and disaster recovery management were not in place**

Since July 2005, the computerized ROR is the only legal document of land ownership. So continuance of the scheme is mission critical for the department. According to guidelines issued by the Board, daily, weekly and monthly back-up was to be taken. However, only monthly back-up was taken at the tehsil computer centres. In absence of regular back-up, one month's data

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[1]    Including 11 field inspected tehsils.
[2]    Where UP ZA & LR Act-1950 was in force.
[3]    Where UP ZA & LR Act-1950 was not in force.

was lost in Handia tehsil (Allahabad district) due to crash of the system. No documentation regarding back-up was maintained. Further, Board had neither documented nor tested any BCP and adequate alternative arrangements for continuing the activities in case of disaster and was dependent on NIC for all technical assistance.

Further, the Board was required to ensure that UPS, generator, computer system, printer etc., were in good working condition. However, in all the test checked tehsils except in Gunnaur tehsil (Budaun district), computer centre was attached with common generator of the tehsil resulting in low voltage, fluctuation and re-booting of the machines, although funds for generator for exclusive use of computer centre were provided. Further computer centre was closed for two to 15 days in eight tehsils[1] due to equipment failure and for two to four days in two tehsils[2] due to database crash.

Fire extinguishers, smoke detectors, electrical warning and alarm equipments were not installed in any of the test checked tehsils. Ventilation and humidity control equipment were also not installed.

Run time errors were occurring in many screens and the Application closed automatically after flashing run time errors in many test checked locations.

In reply, the Government stated (November 2007) that revenue officials were being trained by Department of Electronics Accredited Computer Course (DOEACC), to enable them to operate the scheme independently in future at tehsil level.

### 3.3.6.5   Segregation of duties

There should be judicious separation of duties of employee to reduce the risk of fraud or sabotage by limiting the scope of authority of an individual. According to instructions issued by the Board, SDM was super user, RK nominated by SDM was to work as administrator and other revenue officials as normal user.

However, organizational control was weak and segregation of duties, as defined by the Board, was not adhered to. Revenue officials up to the rank of lekhpal who was below the rank of RK and even private operators were working as administrators.

In reply, the Government stated (November 2007) that necessary instructions were issued by the Board and suitable action against erring officials would be taken after investigation.

### 3.3.6.6   Training

**On site training to revenue officials was incomplete in 39 districts**

The GOI released (May 2005) Rs. 97 lakh for onsite training of revenue officials of 305 tehsils, to be completed by November 2006. However, after six months of the stipulated date of completion of the training and incurring an expenditure of Rs. 45 lakh, only 63 *per cent* of the training programme was completed. The remaining Rs. 52 lakh remained unutilized as of November 2007, whereas training programme in 39 out of 70 districts remained incomplete. Consequently, private operators were working in five of the 11

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[1]    Sawaijpur, Laharpur, Biswan, Musafirkhana, Kadipur, Bilsi, Mohamdi, Malihabad
[2]    Musafirkhana, Kadipur

test checked tehsils and where revenue officials were attached with the computer centre, most of them were not imparted training.

In reply, the Government stated (November 2007) that the training program was continuing in the remaining districts. Reply was not tenable as no progress was made since May-2007 to complete the training.

### 3.3.7 Input/ Validation Controls

**Information stored in database was incomplete and full of errors**

In spite of an expenditure of Rs. 2.60 crore on data updation, receipt of large number of complaints in the test checked tehsils regarding error in name, father's name, plot number, area of the plot, etc. made it evident that no proper validation was carried out on updated data. This resulted in unreliable output due to erroneous, duplicate, missing and incomplete information in the database. Following deficiencies were noticed during data analysis of 18 test checked tehsils:-

### 3.3.7.1 Null, Blank, Zero and Junk characters

- In 13,695 instances, name of account holder and in 35,909 instances name of father/ husband of land holder was entered as blank, null, comma, dot, special characters.

- In 306 cases, account number was null, blank or entered in less than prescribed number of five digit.

- In 4,29,424 accounts *fasli* was either null, blank, junk character or gap between start and end of *fasli* was more or less than the prescribed period of six years.

- Land revenue was found zero against 17,710 accounts.

- Caste description against 19,54,012 land holders was found either null, blank or entered with junk characters.

- In 8,595 cases, plot numbers were entered with null, blank and junk characters. There were instances of availability of data in respect of non-existent plots in the database which resulted in increase of land area of 25,345 hectare. Also, in 9,927 cases, plot numbers were found with zero land area.

- In 14,036 cases, land type was either entered with null, blank, junk characters or incorrect land type was captured.

Year of possession was found null or zero against 11,18,549 plots.

### 3.3.7.2 Lack of validation check led to duplicate/ irrelevant data

- In 16,947 instances, account numbers were entered two to 12 times, 10,788 land holder's name were entered two to 30 times and 1,33,851 plot numbers were entered two to 340 times under the same village.

- In five tehsils, 16 plots were found with minus land area.

- In 140 cases, mutation orders were fed against accounts having blank, null and junk account holder name, account number, etc.

- In 2,567 instances, area of encroached land was found more than the actual area. Further, land area of 163 hectares was shown as encroached which was actually not in existence.

- No input validation on upper and lower limit of land revenue and *gata* (plot) area and prescribed range of six years for *fasli*[1] was incorporated in the software. Negative figures were observed in respect of land revenue and plot area fields.

### 3.3.7.3 Incomplete data

- In 6,459 cases, land holders were found without account details like *fasli*, land type and land revenue.

- In 4,380 cases, plot numbers were found without land holder's details like name, father's name, caste etc.

- In 3,010 instances, accounts existed without account holder and plot details like name, father's name, caste, plot number and area etc.

In reply, the Government stated (November 2007) that there was no adverse impact of irrelevant/ incomplete data on operation of the scheme; however necessary action was being taken at district level to remove such data. Reply was not tenable as RORs and other various reports were being generated with incomplete and missing information.

### 3.3.7.4 Inadequate control on entry and deletion of mutation orders

According to rules, columns 7 to 12 of ROR were meant to enter the orders passed during each *fasli* (column 7 for 1st *fasli*, column 8 for 2nd *fasli* and so on). In the Application, 6 columns of 70 characters (total 420 characters) each were used to enter an order and orders beyond 420 characters were entered and stored as separate order. Further, when an order was deleted, only first 420 characters of the order were deleted and remaining part of the order, i.e. beyond 420 characters, was not deleted.

### 3.3.7.5 Lack of validation checks to control excess holdings of land

According to rules, no landholder shall have the right to transfer by sale or gift any land to any person where the transferee shall, as a result of such sale or gift, becomes entitled to land which together with land, held by his family, will in aggregate exceeds 5.0586 hectare. To enforce this, unique account number was required to be allotted to land holders and part of each *sah-khatedars* (joint account holders) in each plot entered. However, as per computerised databse, in 38,451 instances, the land holders were allotted more than one account ranging from three to 13 times within the same village and 5,627 land holders existed in the database with land area more than prescribed limit. There was no provision in the software to highlight such cases where the land holdings might be in excess of the prescribed limits as per business rules.

In reply, the Board stated (November 2007) that it is difficult to enforce land ceiling on joint account holders as at present there was no provision to enter part of each joint account holder in each plot and the matter was referred to Government for issuance of necessary instruction.

### 3.3.7.6 Deficiencies in Application Software

- Start year of possession of a plot, which, in case of litigation, is an important field could be left blank due to non- availability of check in the Application.

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[1]  Called agriculture year, it starts on 1st July and ends on 30th June.

- Caste description was hard coded in the program and thus making it difficult to add a new caste in future without making changes in the source code of the Application.

### 3.3.8    Change management

### 3.3.8.1    Delayed updation of mutation order in computer

**Mutation orders were updated belatedly**

As per guidelines issued by the Board, all the mutation orders were first to be fed in mutation register (R-6) and thereafter in the computer system on the same day. However, mutation orders were being fed in the computer system one week to 18 months after entry in mutation register.

In reply, the Government stated (November 2007) that necessary action would be taken after investigation.

### 3.3.8.2    Preparation of new RORs

According to rules, RORs were maintained on the basis of *fasli* for a period of six years. Preparation of new RORs for next *fasli* had to be completed by 30 June. Currently, (w.e.f. 1 July 2007) 1415 *fasli* is in progress. Hence preparation of RORs, by incorporating all the changes, for *fasli* 1415-20 (from RORs of 1409-14 *fasli*) was required to be completed by 30 June 2007. However, new RORs were not being prepared timely and new RORs of 1474 villages in 18 test checked tehsils were not prepared as of July 2007, thus posing a challenge to continuance of the CLR scheme.

Further, first six columns of RORs containing name, father's name, plot number, area etc. were to be modified only after every six years, at the time of preparation of new RORs. However, changes were being made in these columns, in between six years without keeping a record of any changes made thus exposing the database to instances of unauthorised changes.

In reply, the Government stated (November 2007) that necessary instructions were already issued by the Board. The reply was not tenable as the instructions were not being followed by district authorities.

### 3.3.9    Unreliable reporting through the software

Reports generated through application should be complete, accurate and reliable. In the application, RORs were being generated for issuance to land holders and four major reports containing information regarding account number, land holder details, plot and area details, land revenue etc. were available in the Application software. However, there was a mismatch in the output generated through these reports, as detailed below:

- There was gross mismatch in the total area of tehsils as per manual and computerized records. In six instances, area of tehsil as per report generated through software was more than the area as per manual record (*Appendix-3.3.1*).

- Differences were noticed in output generated through 'consolidated information of village' and 'category wise ROR' report, 'consolidated information of village' and 'village ROR' report and 'village list' and 'consolidated information of village' report.

### 3.3.10  Database design

- Table structures with different data type and field size were being used in 10 out of 18 test checked tehsils. Due to variant table structure in tehsil database, it was difficult to integrate data for generation of MIS reports for planning and development purposes.

- As date and time used by the application database was based on Operating System date, which could be changed by users by simply switching the clock to a future or back date, it resulted in inaccurate entry of date in audit trail columns and generation of RORs in future and back date.

### 3.3.11  IT Security

#### 3.3.11.1  Password policy and Access Control

The Board had no well-defined and documented password policy. Normal password control procedures like restriction on number of unsuccessful login attempts, routine password change and restriction to access software in holidays and beyond office hours was not incorporated in the Application.

User passwords were not changed since the date of implementation of the scheme. User was not authorized to change the password himself making it difficult to fix the responsibility for unauthorized/ illegal changes made in the database. In many cases, password of administrator and other users were the same. Duplicate users with the same password existed. No control was incorporated in the Application to assign alphanumeric passwords and minimum limit of characters for password. Application had no provision to remove user account in case of transfer/ retirement, etc. of a user to ensure that unauthorized users could not gain access to the system and resulted in very high number of idle users. In most of the test checked tehsils, operators were working as administrator user.

Only OS (Operating System) authentication was required in the Server, no SQL server and database authentication was required to gain the access of back-end database. Password of OS administrator was of one character, null or same as that of login identification and thereby allowing easy access to login on server and making changes in the database. Moreover, the system did not generate any log to record back-end access and the number of failed login attempts. Further, there was no mechanism to monitor the access of un-authorised persons in computer centre.

In reply, the Government stated (November 2007) that necessary instructions for user account and password maintenance were issued (September 2004) by the Board. The reply was not tenable as instructions were not being followed by tehsil authorities.

#### 3.3.11.2  Anti-virus software

Anti virus software was required to be loaded on the system to protect the data from damage and corruption. Anti virus software was not installed on the system in eight[1] out of 18 test checked tehsils and in the remaining test checked tehsils, anti virus was not being updated regularly. As system was found connected to Internet[2] and unauthorized persons were working on application software like MS-Office etc. posing very high risk of getting the

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[1]    Sawaijpur, Laharpur, Biswan, Musafirkhana, Kadipur, Bilsi, Gunnaur and Mohammdi.
[2]    Kadipur (Sultanpur district)

systems infected from virus. In Mohammadi tehsil (Lakhimpur Kheri district), server was infected with virus. In absence of updated anti virus software, security of land data could not be ensured.

In reply, the Government stated (November 2007) that efforts were being made to update anti virus software through annual maintenance contract (AMC).

### 3.3.11.3 Security of IT assets

According to rules, all materials received should be entered in stock register. However, no stock inventory was maintained regarding receipts of IT assets. Further, no records relating to movement of equipment for repair, periodical maintenance and call details etc. were maintained and no system of issue of gate pass was in practice. Annual physical verification of IT assets was also not carried out after installation of hardware. Absence of these checks exposed the assets to the risk of pilferage or misuse. In reply, Tehsildars stated that provisions would be followed in future.

### 3.3.12 Other points of interest

### 3.3.12.1 Non uploading of data on Net

The Board had decided (August 2005) to upload the land records data on Internet by September 2005 which was to be updated by $7^{th}$ of each month. However, data in respect of 44 tehsils (out of 305) was not uploaded on the net.

In reply, the Government stated (November 2007) that due to technical problems data was missing on net and necessary action would be taken after investigation.

### 3.3.12.2 Internal Audit

Internal audit have an important role in protecting the IT system and detecting deviations in prescribed procedure, identifying threats to information system and safeguards for timely rectification. However, no training of IT system, software and new methodology of audit was provided to internal audit personnel.

In reply, the Government stated (November 2007) that necessary training would be provided to internal auditors.

### 3.3.12.3 Infrastructure

According to guidelines issued by GOI, minimum space of 200-250 square feet of carpet area for operation of computer centre in tehsils was required to be provided. However the space provided for computer centre was less than the prescribed area.

### 3.3.12.4 Financial Management

• **Avoidable expenditure on establishment of District Data Centre (DDC) -** The GOI released (December 2005) Rs. 5.95 crore for establishment of DDC. The Department set the target of 30 June 2006 for its establishment and invited rates (3 May 2006) for hardware, software and connectivity between tehsils and DDCs from Government approved firms to be received withing 7 days. Subsequently, NIC had made minor changes in the configuration of server and connectivity without citing any justification. By incorporating the revised configuration the department again invited rates

(26 May 2006) to be received by 27 May 2006 i.e. the next day. Details of rates of three firms are given below

**(Rs. in crore)**

| Sl. No. | Name of the item | UPDESCO | UP Electronic corporation limited | UPTRON Powertronics limited |
|---------|------------------|---------|-----------------------------------|------------------------------|
| 1 | Cost of hardware and other peripheral devices (including warranty of three years) | 2.99 | 3.21 | 5.60 |
| 2 | Cost of Software | 0.36 | 0.51 | 0.46 |
| **Sub Total** | | **3.35** | **3.72** | **6.06** |
| 3 | Cost of connectivity for one year | 0.89 (received on 23 June 2006) | 1.56 | 0.86 |
| **Grand Total** | | **4.24** | **5.28** | **6.92** |

While quoting the rates, UPDESCO intimated that it was obtaining some information about connectivity from Bharat Sanchar Nigam Limited (BSNL) and would quote rate to that effect after a few days and actually intimated rates on 23 June 2006. Meanwhile, the Department had submitted (31 May 2006) the proposal to Government on the basis of two quotations, i.e., UP Electronics Corporation Limited (UPEC) and UPTRON. The Government approved (3 September 2006) the lowest rate of UPEC. The Department issued purchase order on 27 September 2006.

The rates quoted by UPDESCO were the lowest for all the three items separately as well as combined. Terms and conditions of inviting rates from firms did not contain any clause which stopped the Department from entertaining the late receipt of rates of connectivity from UPDESCO. The Department could have submitted a revised proposal to Government after taking into consideration the rates of connectivity by UPDESCO. Even on the basis of quotations for hardware and software, UPDESCO qualified for two items as it was lower by Rs. 37 lakh.

Thus by not submitting a revised proposal to Government after taking into consideration the rates of connectivity provided by UPDESCO, the Department had incurred an avoidable expenditure of Rs. 1.04 crore.

In reply, the Government stated (November 2007) that UPEC was selected as its rate was lower between two firms who have submitted rates for all the three items and keeping in view the better co-ordination, entire work was entrusted to a single firm.

Reply was not tenable as only one day was given to firms for submitting the revised rates. Further, all the three items could be independently purchased/installed and DDC could not be established even after one year against the target date (30 June 2006).

• **Irregular/ Idle expenditure -** In the proposal sent by the Department (November 2005) to GOI for establishment of DDCs and in the approval and release of fund by GOI (December 2005), there was no mention of purchase and installation of touch screen kiosks. However, the Department purchased (September 2006) 70 touch screen kiosks at a cost of Rs. 68 lakh for

installation at Sadar[1] tehsil of each district out of DDCs fund. Hence, expenditure incurred on purchase of touch screen kiosks was irregular. In reply, the Government stated (November 2007) that touch screen kiosks were purchased at the instance of the task force. Reply was not tenable as the task force had recommended (February 2006) for its purchase only after getting necessary approval from Government. Further, touch screen kiosks were not installed as of November 2007 rendering the expenditure idle.

- **Diversion of funds -** The GOI released (May 2005) Rs. 20 lakh for establishment of State level monitoring cell. Of this, computer hardware (Rs. 11 lakh) was purchased, out of which hardware of Rs. 7 lakh was diverted for computerization of court cases of the Board. Similarly, 15 computers, 15 UPS and one printer purchased at a cost of Rs. 6 lakh for continuous transmission of data in DDC were installed in the chambers of officers and sections of the Board.

In reply, the Government stated (November 2007) that hardware was purchased and installed as per the decision of Chairman, Board. The reply was not tenable as the funds were meant for specific purposes and could not be diverted.

### 3.3.13 Conclusion

The computerization scheme of land records started in 1988-89 was not a complete and reliable system of maintenance of land records and generation of reports. It is replete with errors due to deficient system design, incomplete data capture from the manual records, deficient controls over the input data and invalidated data in most of the test checked tehsils. As a result, the concept of Computerization of Land Records as envisaged in the scheme could not be achieved.

### 3.3.14 Recommendations

- A business continuity plan needs to be finalized and restoration drills as necessitated unders such plans should be carried out to ensure ability to continue operation in case of disruptions.

- Validation of data should be carried out to avoid possibilities of redundant data and erroneous data by way of incorporating input controls for issue of reliable RORs

- Deficiencies in the database and application design should be reviewed and steps may be taken for producing reliable and accurate output.

- In order to avoid unauthorised access to and manipulation in data, a clear password policy should be in force alongwith provisions for audit trails on all tables containing critical data.

- In order to ensure physical safety of the assets, policies for physical access to and storage of the assets should be framed.

The above points were referred to the Government in September 2007; reply received (November 2007) was incorporated in the review at appropriate places.

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[1]    Tehsil at district headquarters