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INDIAN INSTITUTE FOR
HUMAN SETTLEMENTS

Land Records Modernisation

Technology Transitions

Policy Brief

LAND RECORDS MODERNISATION: TECHNOLOGY TRANSITIONS

National Modernisation Initiative

The modernisation of land records, via new technology components, gained traction in India just before liberalisation in 1991. In 1987, during the 7th Five-Year Plan period, the Ministry of Rural Development launched the pilot phase of the Strengthening of Revenue Administration and Updating of Land Records (SRA&ULR) programme in Bihar and Odisha. Over 1989-90, this initiative was launched across all states and union territories, with funding in equal parts from the Centre and the states. The revenue and land reform departments were in charge and the focus was on capacity building in the survey and settlement department, and surveying areas where there were no pre-existing records. There was also support for modernisation and updating of 'survey maps, reports and documents, storage facilities, copying and updating of land and crop records by adopting latest science and technology inputs' (MoRD Annual Report, 2006-07)[i]. The next programme was the Computerisation of Land Records (CoLR), launched as a pilot by the central government in 1988-89.

The National Land Records Modernisation Programme (NLRMP), launched in 2008, combined the SRA &ULR and the CoLR programmes. As of December 2015, NLRMP has been formally included under the umbrella of the Digital India initiative, and renamed as the Digital India Land Records Modernisation Programme (DILRMP). The DILRMP is operationalised under the Department of Land Resources (DoLR), Ministry of Rural Development. DILRMP seeks 'computerisation of all land records including mutations, digitisation of maps and integration of textual and spatial data, survey/resurvey and updating of all survey and settlement records including creation of original cadastral records wherever necessary, computerisation of registration and its integration with the land records maintenance system, development of core Geospatial Information System (GIS) and capacity building'[ii]. These initiatives are reducing delays, simplifying procedures and improving administrative efficiency, thus improving overall access to records.

Additionally, the DILRMP advocates a shift from the current practice of registering deeds and presumptive land records to a system of conclusive titles. This is a significant legal shift. For this to be operationalised in the existing legislative, institutional and procedural legacies imbued in the current land records system, including the relationship between the revenue department and the judiciary, the existing backlog of land disputes and adequate due-diligence to address data mismatches with technology transitions needs to be addressed.

Status of Modernisation

DoLR compiles state-wise status of computerisation under DILRMP. As per their latest statistics[iii], out of a total of 35 states and UTs, majority have computerised their registration process and their RoRs (30 and 31, respectively).[3] However, details are still awaited as to the quality and extent of such efforts. DOLR also notes that several states have stopped manual issue of RoRs (18 states) and placed RoR data on their websites (22 states). However, significantly, as per DOLR, only 11 states have integrated land records with the registration process. Similarly, only five states have integrated Bhu-Naksha with RoR and made it available on their website.

There are also challenges of traction, utilisation and implementation. As of September 2014[iv], state governments had submitted a budget of Rs. 4,298.4 crores (around $716 million)[v] to implement NLRMP, to the central government. The central government had approved Rs. 2,874.7 crores (around $479 million). Of that amount, by the end of March 2015[vi], only approximately Rs. 1,131.1 crores (around $188.5 million) had been released by the central government. Out of this amount, it seems, only 38.7 per cent had been utilised by the states. This raises questions of adequate implementation.

State-Level Experiences

The state-wise status of DILRMP implementation is provided as an annexe. The Karnataka, Haryana and Himachal cases below highlight that each state government develops its own focus, given their own particular ground realities.

Karnataka

Karnataka has been a pioneer in modernising land records. BHOOMI is the flagship project for automating and modernising the process of producing the Record of Rights, Tenancy and Crops (RTC) and managing applications for changes in the mutation register. BHOOMI has replaced manual generation of RTCs and computerised 20 million records for 6.7 million farmers (Bhatnagar, 2003)[vii]. The land and property related technology platforms that have been launched in Karnataka are highlighted below.

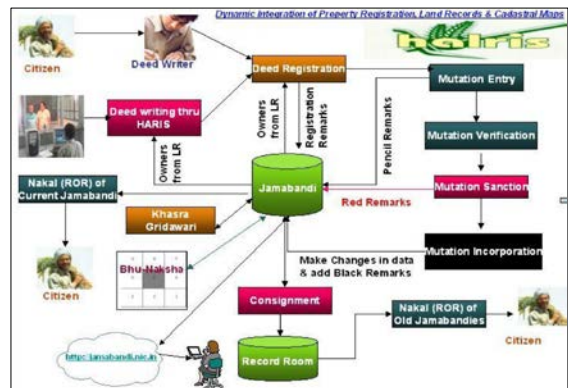Source: IIHS Secondary Research, 2014

Haryana

In Haryana, the main technology platforms launched include HARIS (registration software), HALRIS (digitised land records and its updating through mutation), HARIS#HALRIS Bridge, and Bhu-Naksha, for spatial data and property subdivisions, remotely.
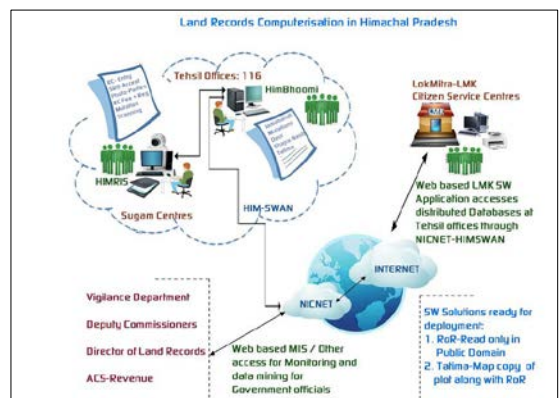
HARIS and HALRIS are operational in all districts, but the working of the HARIS#HALRIS Bridge varies from one *tehsil* headquarter to another. In 2010, HARSAC was appointed as the nodal agency to develop the geospatial database of cadastral maps across the state. Scanning and vectorisation of *Mussavis*, establishment of primary and secondary control points, satellite data acquisition, and DEM generation has been completed. As of Sept. 2014, 83 per cent of tertiary control points were yet to be established, and 43 per cent of *Mussavis* were yet to be updated post digitisation.

Source: Haryana Revenue Department, 2014

Himachal Pradesh

Himachal has two technology platforms: for registration processes and data (HimRIS) and the mutation data and land records (HimBHOOMI). The HimBhoomi software

design highlights flexibility of technology platforms. HimBHOOMI includes multiple records documents, e.g. the *Shajra Nasb*, the RoR, the *Khasra Gidawari*, etc. It also covers variations across the state, while delivering a level of standardisation acceptable to ground-level revenue staff. In 2013, HimBhoomi was operational in 101 out of 109 tehsils. HimRIS was launched in 2005 and linked with HimBHOOMI in 2008. As of 2014, HimRIS had been implemented in 85 tehsils, and was yet to be introduced in tehsils where the number of transactions is relatively lower. Parallel initiatives have been introduced for

digitisations of old maps, and creation of new maps through ETS-GPS resurveys – both of which will be operationalized via BhuNaksha – but their effectiveness is yet to be seen.

Bihar
System of Computerised Registration (SCORE, introduced in 2005) in Bihar has made registration of deeds a computerised process, with relevant information being uploaded on websites. Introduced in 2007, BhuAbhilekh software has enabled digitisation and uploading of RoRs of 13 out of 38 districts. But as of January 2015, it was yet to operationalise in terms to enabling access to legally certified copies at tehsil or district level, or in keeping the digitised records updated. All old maps (Cadastral survey during 1895-1920) have been digitised, and printouts are readily available to citizens. Urban area maps and Resurvey Maps (1950 onwards) are yet to be digitised completely. The latest round of surveys are use aerial photography and ETS-GPS surveys to create digital records (spatial and textual), but their success is yet to be seen.

Gujarat
Gujarat has made significant progress with land records modernisation in a relatively short time span. The state currently has seamless integration between its digitised land records (via e-Dhara), and the registration process (via GARVI). Any registration for an agricultural land immediately leads to a *kachi* mutation entry, which is later certified or rejected after due diligence. Gujarat has now progressed towards creating a new set of digital spatial records, via the resurvey process, using 100 per cent ground truthing method. The City Survey Information System (CSIS) enables digitised mutation for urban records, but as of August 2015, all property cards were yet to be digitised. A link between CSIS and the registration software GARVI is proposed, to facilitate automatic mutation entry for property cards too.

Operational Challenges with Technology Transitions
1. **Flexible Module Design:** The situation in each state presents its own on-ground challenges and variations in land records. A significant learning curve is associated with creating workable and integrated technology platforms including module design, to represent property relationships on-ground, different data types, and *de jure* and *de facto* processes. Further, most states have their individual learning curves in designing sufficient number of 'triggers' between technology platforms to allow seamless operations and minimise possibilities of fraud.
1. **Significant Backlog:** Most states have significant backlogs in transferring existing spatial records onto technology platforms. In the case of Karnataka the backlog was computed to be about 20 years. Bihar has a significant backlog in digitisation of textual records itself. Addressing the data backlog is both time consuming and raises capacity issues.
2. **Capacity Issues:** The type of work associated with technology transitions typically involves a large technical staff for digitisation and currently systems are being put in place. However, once systems are running, it requires only a small group of technical staff to give support to the revenue functionaries. Most government departments do not have the flexibility to scale up and scale down so quickly. Hence most of the work is outsourced. However, the states have faced challenges in effectively managing external vendors. Further, capacity issues exist with regard to training revenue staff to be conversant with new technologies. Where the revenue staff is younger, such technological capacity building has been quicker, but their lack of experience with respect to revenue procedures is often questioned.
3. **Obsolescence and Time Lag:** Time to design modules and address backlogs often means that technology transitions are associated with multiple instances of technology obsolescence and the need to migrate data between platforms. In many cases this has not been possible, and the base data digitisation has had to be repeated.
4. **Data Errors:** Typically, no attempt is made to rectify errors that exist in the paper records, when transferring the data in existing paper records onto GIS and Database Management Systems (DBMS) platforms via digitisation and computerisation. Therefore, new records are not significantly more accurate than paper records.
5. **Data Mismatches and Need for Protocols:** There is data divergence between new spatial databases (with geo-referencing, there is more accuracy but no legal tender) and existing physical

records (less accurate but legally valid documents). There is a need to develop state level protocols to address data mismatches between spatial data in revenue records and new data being generated by geo-referenced surveys and the mismatches between the RoR data about spatial extent and the new geo-referenced survey data. For example, the revenue department of Gujarat has published a Resurvey Manual which discusses how various issues faced during resurvey are to be addressed.

6. **Evaluation and Monitoring:** With time it may be important to develop more broad-based evaluation mechanisms to assess the effect of modernisation efforts on objectives identified at the time of programme implementation, including,
    o Mitigation of property disputes
    o Improvement in credit access
    o Easier and more equitable land markets

Broader Challenges of Modernising Land Records using Technology

The Revenue Department's land records are presumptive, i.e., they may be challenged in court. Courts play a central role in arbitrating property claims and disputes. The DILRMP advocates a shift to conclusive titles, supported by government indemnity. The processes being adopted in technology transitions have to build in adequate opportunities for claims, objections, and dispute resolution. Without such processes, courts are unlikely to give legal credence to the new records and recording practices.

Key legal concerns include:
- Addressing existing errors being transferred from paper records.
- Addressing existing pending disputes.
- Creating statutory backing for new processes including e-stamping and digital signatures.
- Protocols to address data mismatches between different sets of records.

The other challenge is for the new systems to have greater clarity and comprehensiveness, in terms of: (a) spatial coverage, (b) type of properties recorded, (c) type of rights and tenurial arrangements recorded, and (d) type of transactional instruments recorded.

Technology transitions have to be embedded within the political economy of institutions that work on land records. Without a thorough understanding of revenue realities, technology is inadequate. An interesting illustration pertains to lessons learnt from the pilot technology initiatives of Himachal Pradesh in the 1990s, with reference to the *Shajra Nasb*. Later, technology initiatives have incorporated the *Shajra Nasb* as an integral part of the land records system, while initial pilots had not taken the document into account. The *Shajra Nasb* is a document which contains the genealogical tree of the entire village on the basis of which the *khata* (account) numbers are determined, which in turn are responsible for indexing the *jamabandis* in a particular sequence. As such the *Shajra Nasb* works like an index to understand the *jamabandi* entries. Accordingly, the entire process of having digitised the *jamabandis* without the *Shajra Nasb* documents implies scrapping of the original exercise and beginning anew with digitisation of the *Shajra Nasb*.

Similarly in Haryana, in pioneering initiatives in Rohtak, a lacuna which keeps the current exercise from creating a full-fledged cadastre based urban property records, is the practice of geo-tagging plots/properties (tagging a point within the plot), rather than geo-referencing the actual plot boundary to update the cadastral revenue map, which has boundary details only to the level of 'settlement' areas, referenced by survey numbers. In the future, there are plans to integrate the map data with *khasra* numbers at the *tehsil* level so that the data can be updated when a transaction occurs.

It is expected that a comprehensive understanding of the revenue system in each state would become imperative in technology upgradation initiatives. This is a factor that needs to be taken into account while designing any central modernisation scheme or programme.

ANNEX 5.1: TECHNOLOGY TRANSITIONS

Status of land record computerisation

Service	Gujarat	Haryana	Himachal Pradesh	Karnataka	Puducherry
Registration					
Computerisation of Registration	Yes, through GARVI	Yes, through HARIS	Yes, through HIMRIS	Yes, through KAVERI	Yes
Abolition of Stamp Papers	E-stamping	Bank challan for stamp duty higher than Rs.10,000[viii]	E-stamping[ix]	E-stamping	Yes
Interconnectivity between Revenue and Registration offices	Yes	Yes	Yes	Yes	Yes
Rural Land Record Computerisation					
Data entry of textual data (Records of Rights)	Yes	Yes	Yes	Yes	Yes
Providing legal sanctity to computerised RoR	Yes	Yes	Yes	Yes	Yes
Issue of computerised copy of RoR	Yes	Yes	Yes	Yes	Yes
Issuance of digitally signed RoRs	No	No*	No*	Yes	No*
Complete stoppage of issuance of RoRs through manual procedure	Yes	Yes	Yes/No[x]	Yes	Yes
Mutations using computers	Yes, through E-Dhara	Yes, through HALRIS	Yes, through HimBhoomi	Yes, through Bhoomi	Yes, through Nilamagal
Publishing of RoR on website	Yes	Yes	Yes, but real-time updating affected by internet connectivity	Yes	Yes, but not up-to-date
Issuance of computerised RoR through Citizen Service Centres/Kiosks (at *tehsil* level)	Yes, through E-Dhara Kendra	Only through HALRIS centres	Yes, through Lok Seva Kendra	Yes, through Bhoomi centers	Yes
Digitisation of maps and integration of textual and spatial data	Under progress	Bhu Naksha under progress, with GIS component	Bhu Naksha under progress	Digitisation under progress. Bhu-mojini for parallel updating of spatial records.	Yes
Survey/Resurvey and updating of survey and settlement	Under progress	Under progress	Periodic (under progress)		

Service	Gujarat	Haryana	Himachal Pradesh	Karnataka	Puducherry
records					
Computerisation of Urban Records					
Computerised urban records	Partial progress under CSIS	Yes	Yes	No. Partial progress under UPOR	Yes
Publishing of Urban records on website	Proposed under CSIS	Yes, through HALRIS	Yes, through HimBhoomi		Yes, through Nilamagal
Online mutation of urban records	Partial progress under CSIS	Yes, through HALRIS	Yes, through HimBhoomi		Yes, through Nilamagal

Source: based on DoLR (2013, March 31); updated via secondary research by IIHS
* Does not exist as of March 2013. Source: DoLR (2013, March 31)

i Retrieved from http://rural.nic.in/sites/downloads/annual-report/anualreport0607_eng.pdf

ii Department of Land Resources, Ministry of Rural Development, Government of India. (2008) NLRMP: Guidelines, Technical Manuals and MIS 2008-09. New Delhi: DoLR. Retrieved
http://dolr.nic.in/dolr/downloads/pdfs/Guidelines%20%20NLRMP%2017.4.2009.pdf

iii DoLR, 2016, State-wise Physical Progress as on 16th March 2016. DoLR, Ministry of Rural Development, Government of India. Accessed at http://dolr.nic.in/dolr/downloads/pdfs/DILRMP%20Physical%20Progress%202016-03-16.pdf on 24/08/2016.

iv DoLR, 2014: accessed at http://nlrmp.nic.in/faces/rpt/rptApprovedClaim2.xhtml?id=./../master/rpt.xhtml on 05/02/2015

v An exchange rate of USD 1= INR 60 has been used.

vi DoLR, 2015: accessed at http://dolr.nic.in/dolr/downloads/pdfs/NLRMP%20Financial%20Progress%202015-03-31.pdf on 24/06/2015.

vii Bhatnagar, S. (2003). E-government and access to information. *Global Corruption Report, 2003*, 24-32

viii haryanaforms.nic.in/dwd/Wf/16.pdf

ix https://www.shcilestamp.com/estamp_statehimachal.html

x Conflicting status from different sources. DoLR (2013, March 31) states that HP is yet to abolish paper records. Standing Committee on Rural Development (2012) and DoLR website (n.d.) (http://himachal.nic.in/index1.php?lang=1&dpt_id=13&level=1&sublinkid=4260&lid=5095) state that paper records have been banned.