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The NCAER Land Records and Services Index

N-LRSI 2020

National Council of Applied Economic Research

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OMIDYAR NETWORK INDIA

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February 2020

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH

NCAER India Centre, 11 Indraprastha Estate, New Delhi 110 002, India

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About Omidyar Network India

Omidyar Network India invests in bold entrepreneurs who help create a meaningful life for every Indian, especially the hundreds of millions of Indians in low-income and lower-middle-income populations, ranging from the poorest among us to the existing middle class. To drive empowerment and social impact at scale, we work with entrepreneurs in the private, non-profit and public sectors, who are tackling India's hardest and most chronic problems. We make equity investments in early stage enterprises and provide grants to non-profits in the areas of Digital Identity, Education, Emerging Tech, Financial Inclusion, Governance & Citizen Engagement, and Property Rights. Omidyar Network India is part of The Omidyar Group, a diverse collection of companies, organizations, and initiatives, supported by philanthropists Pam and Pierre Omidyar, founders of eBay.

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Professor Anil K Sharma
Secretary and Operations Director
The National Council of Applied Economic Research
NCAER India Centre, 11, Indraprastha Estate, New Delhi–110 002
Tel: +91-11-2345 2657, 6120 2698
Email: aksharma@ncaer.org
www.ncaer.org

Publications Coordinator
Jagbir Singh Punia

Design & data visualisation by
HowINDIALives
www.howindialives.com

FOREWORD

India has made substantial progress on improving its rating on the World Bank's Ease of Doing Business (EODB) index, moving up from a 130th rank in 2016 to 63rd in 2019. Unfortunately, this stands in marked contrast to the poor showing on the component of the EODB index that relates to land—the ease of registering property. The ease of generating and using reliable digital land records can have considerable significance for India's rapid economic growth through the better functioning of land markets and the boost to investment that better functioning land markets can give.

Land policy in India has suffered from several deficits. Relative to its size, India suffers from a paucity of economic research, policy analysis, and systematic data on land, leading to well-meaning but poorly designed and implemented government programs. Land policy is defined constitutionally as the prerogative of India's States and the focus of data and analytical efforts relating to land must also focus on the States.

To help address these deficits, and with the generous support of the Omidyar Network, NCAER launched the NCAER Land Policy Initiative (NLPI) in April 2019 to build on our prior analytical work on land, our 60 plus years of experience with data collection, and our long-standing relationship of trust with governments. The objectives of the NLPI are to (1) raise official and citizen awareness of the distortions in India's land markets and their cost to the economy; (2) produce and curate evidence and land data and to suggest solutions and state rankings that can nudge States through competitive federalism to improve their land administration, records and services; (3) where requested, pilot such solutions with States and evaluate them; and (4) help build a larger research community of analysts and experts on land issues in India

In the first nine months of the NLPI, the primary focus has been the construction of an index to measure the ease of using land records. This NCAER Land Records Services Index (N-LRSI) covers all Indian States and UTs with a focus on the supply of land records. The N-LRSI focuses on two broad components –the extent of digitization of land records and the quality of these land records. The first component is based on three dimensions– textual records (the record of rights), spatial records (cadastral maps) and the registration process.

The NCAER team carried out the second component of assessing the quality of the land records by focusing on five desirable elements that ought to be captured in a comprehensive system of records–the updating of ownership, the extent of joint ownership, land use, land area or extent, and the recording of encumbrances. All these elements are closely connected to land disputes and to the ease with which transactions in land can be completed and legally recorded. The N-LRSI is based on proxy indicators to measure the quality of the digitized land records for each of these five elements.

Madhya Pradesh, Odisha, Maharashtra, Chhattisgarh and Tamil Nadu are the best performing states with scores between 60 and 75 points on the LRSI. West Bengal, Jharkhand, Rajasthan, Telangana, Andhra Pradesh and Uttar Pradesh are in the 50-60 points category. For the registration component, Maharashtra emerged as the leader, while Jharkhand, Odisha and Chhattisgarh were the front-runners on the quality of their land records.

The N-LRSI is timely. In preliminary discussions it is already attracting the attention of policymakers at the Central and State levels. The N-LRSI can help formulate state action plans to attain the goal of secure,

assured land records that mirror ground realities and are generated by efficient titling services. The N-LRSI's comparative assessment of Indian States and UTs should make it possible for the laggard states to learn from the best performing states on how to improve the supply of good, reliable, accessible digital land records. Similarly, the Central Government can use the N-LRSI to explore approaches to rewarding and recognising the States and UTs that perform better on the index so that the others are encouraged to improve their standing.

In a second phase of this work, also under the NLPI umbrella, the NCAER team will work to assess the demand side of the ease of using land records through a household survey planned for later this year.

This work was carried out by the NLPI team at NCAER led by Dr Devendra B Gupta and Mr Deepak Sanan, and consisting of Dr Prerna Prabhakar, Mr Somnath Sen, Dr Charu Jain, Ms Anika Kapoor, Mr Sam Anand, Ms Kajal Gupta, Ms Aarushi Kuchhal, Ms Sameera Mathur, Ms Chandni Mishra, Ms Falak Naz, Ms Nishika Pal, Ms Puja Roy, Ms Payal Samar, Mr Nitin Sankhla, Ms Disha Saxena, Ms Arundhati Sharma, Ms Khyati Singh, Mr Deepak Singh, Mr Vijay Singh Bangari, Mr Yuvraj Sunger, Ms Ankita Tripathi, Mr Devesh Vashishth, and Ms Apoorva. I am grateful to them for their intense, time-consuming effort in collecting the data and constructing the NCAER Land Records Services Index. I am grateful to Avinash Singh and his team at How India Lives for visualising the N-LRSI in many interesting ways and for the overall design of this report.

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February 18, 2020

Dr Shekhar Shah
Director General, NCAER

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Deepak Sanan, Devendra B Gupta,
Prerna Prabhakar and Charu Jain

THE NLPI TEAM

PROJECT LEAD

Deepak Sanan and Devendra B Gupta

SENIOR ADVISOR

Somnath Sen

RESEARCH TEAM

Prerna Prabhakar
Charu Jain
Anika Kapoor

SUPPORT RESEARCH TEAM

Aarushi Kuchhal, Aman Agarwal, Ankita Tripathi, Apoorva, Arundhati Sharma, Chandni Mishra, Deepak Singh, Devesh Vashishth, Disha Saxena, Divy Rangan, Falak Naz, Kajal Gupta , Khyati Singh, Nishika Pal, Nitin Sankhla, Payal Samar, Puja Roy, Sam Anand, Sameera Mathur, Vijay Singh Bangari and Yuvraj Sunger

PROJECT COORDINATOR: Anika Kapoor

EDITOR: Anupma Mehta

IT SUPPORT: Praveen Sachdeva

TEAM SUPPORT: Sadhna Singh

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF BOXES

ABBREVIATIONS

CAPTCHA	Completely Automated Public Turing test to tell Computers and Humans Apart
CBDT	Central Board of Direct Taxation
CLR	Computerisation of Land Records
CM	Cadastral Map
CR	Circle Rates
DI-LRMP	Digital-India Land Records Modernisation Programme
DoLR	Department of Land Record
E-GRAS	Electronic- Government Revenue Accounting System
EoDB	Ease of Doing Business
FAQ_	Frequently Asked Questions
GIS	Geographical Information System
GoI	Government of India
KCs	Knowledge Correspondent
LPI	Land Policy Initiative
MIS	Management Information System
NCAER	National Council of Applied Economic Research
NLRMP	National Land Records Modernisation Programme
N-LRSI	NCAER Land Records and Services Index
ON	Omidyar Network
PDF	Portable Document Format
PPS	Probability Proportional to Size
RoRs	Records of Rights
SI	Sampling Interval
SRA & ULR	Strengthening of Revenue Administration and Updating of Land Records
SROs	Sub-Registrar Office
UTs	Union Territory

EXECUTIVE SUMMARY

1. The NCAER-Land Records and Services Index (N-LRSI) 2019-20 could not have come at a more opportune moment. The Indian economy has slowed down dramatically over 2018 and 2019. Commentators have increasingly pointed out that the slowdown is a structural rather than a cyclical phenomenon. Attention to reform in the hitherto neglected areas will be critical for India to resume a high-growth journey. In this context, land (and labour) have been listed as the sectors deserving the highest priority. Lack of improvements in the ability to acquire and hold land, and use and transact in land and property, are major impediments inhibiting both investment and poverty reduction. India's spectacular improvement on the overall index of Ease of Doing Business (EoDB) compiled by the World Bank, stands in marked contrast to the dismal showing with regard to the component of the index that relates to land (ease of registering property). Commentators have recommended acceleration in mapping of land, improving titling, registering of changes in ownership, as well as transparent processes to determine and alter land zoning.

2. Enhancing progress in making available land for large-scale investment opportunities as well as its use as a productive asset by the poor in a dispute-free environment is critically dependent on access to accurate and up-to-date land and property records. This has engaged the attention of the Government of India since the launch of the Computerisation of Land Records (CLR) scheme in 1987-88. However, despite three decades of successive programmes, studies indicate a mixed record of the impact of the digitisation of land records and the registration process across States/UTs. Therefore, this exercise sought to seek answers to the following questions: What is the reality across the States/UTs? Where has significant progress been made? Where are gaps most visible? and What can be done to improve the situation? Presenting a comparative picture across States/UTs on an annual basis is expected to instil a sense of competition and create an incentive for the States/UTs to do better.

3. The N-LRSI 2019-20 (or the Index, hereinafter) set out to answer the following questions for all the States and Union Territories (UTs) in India:

i) What is the actual extent of digitisation of land records and the registration process?

ii) What is the improvement in key citizen services brought about by this digitisation process?

iii) What is the improvement in the quality of land record brought about by the digitisation process?

4. The Index has been constructed by assigning appropriate weights to achievement on a number of parameters. The components comprising the Index, their weightage in the Index, and the method of evaluation are presented in Table E.1.

N-LRSI Scores and Ranking of States/UTs

5. The N-LRSI Scores for States and UTs of India, 2019-20 are presented in Figure (E.1).

Figure E.1: N-LRSI Parameters, Weights and Mode of Evaluation

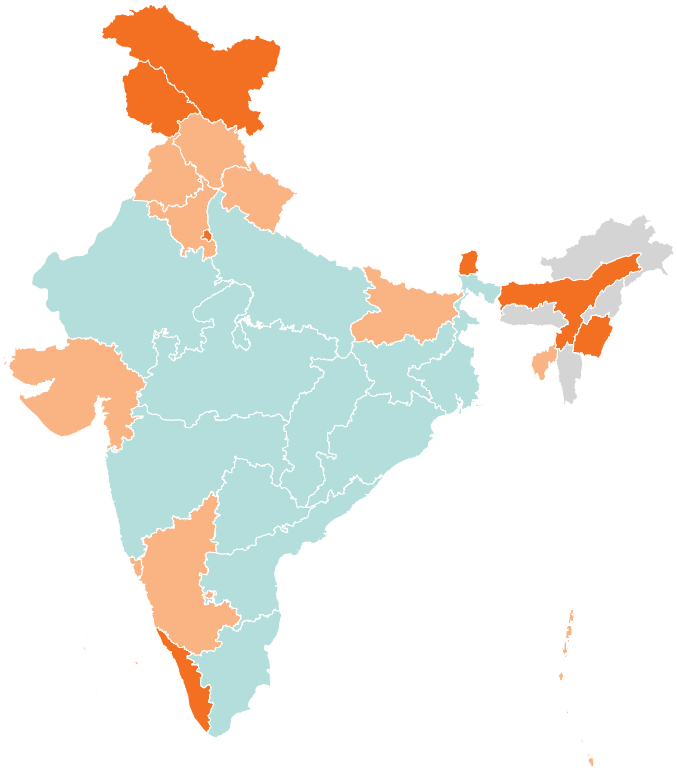
(Maximum points =100)

PARTICULARS	POINTS	EVALUATION METHOD: Desk research	KCs	Test Checks
TEXTUAL RECORD				
a. Digitisation of Records of Rights (RoRs)	15	●	●	●
b. Availability of legally useable copies of RoRs	5	○	●	○
SPATIAL RECORD				
a. Digitisation of Cadastral Maps (CMs)	15	●	●	●
b. Availability of legally useable copies of CMs	5	○	●	○
REGISTRATION				
a. Public Entry of Data	4	●	●	○
b. Availability of Circle Rates	4	○	○	●
c. Mode of Payment of Stamp Duty / Registration Fee	4	●	●	○
d. Digital Attestation of Document by Sub Registrar office (SRO)	4	○	●	○
e. On-line Delivery of Registered Document	4	○	●	○
QUALITY OF LAND RECORDS				
a. Updating Ownership	5	○	●	○
b. Extent of Joint Ownership	10	○	○	●
c. Land Use	10	○	○	●
d. Land Area	10	○	○	●
e. Recording Encumbrances	5	○	●	○

Note: KCs – Knowledge Correspondents (KCs were contacted under this exercise to obtain and advise on specific questions about the status and process of land records in the States/UTs; and they variously comprised senior officers, other retired and serving revenue officers and/or experts with knowledge of land matters in the relevant State / UT.)

Source: N-LRSI 2019-20, NCAER

Figure E.2: N-LRSI 2019-20



Scoring 60-75 points, Madhya Pradesh, Odisha, Maharashtra, Chhattisgarh, and Tamil Nadu are the five best performing states.

West Bengal, Jharkhand, Rajasthan, Telangana, Andhra Pradesh, and Uttar Pradesh are the six states in the 50-60 point category.

N-LRSI Rank	States/UTs	N-LRSI Score
1	Madhya Pradesh	74.9
2	Odisha	67.5
3	Maharashtra	65.3
4	Chhattisgarh	64.1
5	Tamil Nadu	63.0
6	West Bengal	61.8
7	Jharkhand	59.2
8	Rajasthan	56.5
9	Telangana	55.3
10	Andhra Pradesh	53.9
11	Uttar Pradesh	52.2
12	Lakshadweep	47.9
13	Himachal Pradesh	47.5
14	Goa	41.3
15	Karnataka	40.9
16	Punjab	40.5
17	Uttarakhand	36.1
18	Haryana	35.3
19	Gujarat	35.0
20	Tripura	33.4
21	Puducherry	32.3
22	Dadra & Nagar Haveli	32.0
23	Daman & Diu	30.1
24	Bihar	28.8
25	Andaman & Nicobar	25.4
26	NCT of Delhi	22.1
27	Manipur	21.9
28	Assam	19.4
29	Kerala	10.7
30	Chandigarh	6.0
31	Sikkim	5.9
32	Jammu & Kashmir	4.3
33	Ladakh	2.0

Average 38.56

Source: N-LRSI 2019-20, NCAER

Figure E.3: N-LRSI 2019-20 by its 4 Components

0-25 25.1-50 50.1-75 75.1-100 Note: All values in a component were rebased to 100, and colors were assigned in four scoring bands.

	N-LRSI Rank	N-LRSI Score (out of 100)	Textual Record (out of 20)	Spatial Record (out of 20)	Registration (out of 20)	Quality of Land Records (out of 40)
Madhya Pradesh	1	74.9	19.0	16.7	15.6	23.7
Odisha	2	67.5	15.0	15.0	11.2	26.3
Maharashtra	3	65.3	18.9	7.5	15.7	23.2
Chhattisgarh	4	64.1	19.4	15.7	4.7	24.3
Tamil Nadu	5	63.0	18.9	11.8	12.5	19.8
West Bengal	6	61.8	13.3	11.8	14.9	21.8
Jharkhand	7	59.2	10.5	8.6	9.0	31.2
Rajasthan	8	56.5	16.2	3.3	11.7	25.3
Telangana	9	55.3	15.0	10.0	9.3	20.9
Andhra Pradesh	10	53.9	16.5	2.7	13.6	21.1
Uttar Pradesh	11	52.2	18.7	1.5	11.2	20.9
Lakshadweep	12	47.9	12.6	16.8	0.0	18.4
Himachal Pradesh	13	47.5	15.0	5.4	5.0	22.2
Goa	14	41.3	19.2	0.0	7.7	14.4
Karnataka	15	40.9	16.1	0.0	11.1	13.7
Punjab	16	40.5	15.2	0.0	10.8	14.4
Uttarakhand	17	36.1	13.6	0.0	13.6	8.9
Haryana	18	35.3	10.7	0.0	11.8	12.9
Gujarat	19	35.0	16.5	0.0	4.7	13.9
Tripura	20	33.4	16.1	0.0	4.0	13.3
Puducherry	21	32.3	16.3	0.0	5.2	10.8
Dadra & Nagar Haveli	22	32.0	20.0	0.0	2.0	10.0
Daman & Diu	23	30.1	14.3	0.0	2.0	13.9
Bihar	24	28.8	6.8	2.5	7.5	12.0
Andaman & Nicobar	25	25.4	12.9	0.0	2.0	10.5
NCT of Delhi	26	22.1	8.5	0.0	2.0	11.6
Manipur	27	21.9	1.8	0.0	10.0	10.1
Assam	28	19.4	7.9	0.0	2.0	9.5
Kerala	29	10.7	0.0	0.7	5.5	4.5
Chandigarh	30	6.0	0.0	0.0	4.0	2.0
Sikkim	31	5.9	0.0	0.0	3.9	2.0
Jammu & Kashmir	32	4.3	0.0	0.0	2.3	2.0
Ladakh	33	2.0	0.0	0.0	0.0	2.0

Source: N-LRSI 2019-20, NCAER

Figure E.4: N-LRSI 2019-20 by its 14 Indicators

0-25 25.1-50 50.1-75 75.1-100 Note: All values in a component were rebased to 100, and colors were assigned in four scoring bands.

N-LRSI Rank		Textual Record		Spatial Record		Registration		
		Digitisation of Records of Rights (RoRs) (out of 15)	Availability of legally useable copies of RoRs (out of 5)	Digitisation of Cadastral Maps (CMs) (out of 15)	Availability of legally useable copies of CMs (out of 5)	Public Entry of Data (out of 4)	Availability of Circle Rates (out of 4)	Mode of Payment of Stamp Duty / Registration Fee (out of 4)
1	Madhya Pradesh	14.0	5.0	11.7	5.0	4.0	3.6	4.0
2	Odisha	15.0	0.0	15.0	0.0	0.0	3.2	4.0
3	Maharashtra	13.9	5.0	7.5	0.0	4.0	3.7	4.0
4	Chhattisgarh	14.4	5.0	13.2	2.5	0.0	2.7	2.0
5	Tamil Nadu	13.9	5.0	6.8	5.0	4.0	2.5	4.0
6	West Bengal	13.3	0.0	11.8	0.0	4.0	2.9	4.0
7	Jharkhand	10.5	0.0	8.6	0.0	4.0	3.0	2.0
8	Rajasthan	13.7	2.5	0.8	2.5	4.0	3.7	4.0
9	Telangana	12.5	2.5	10.0	0.0	4.0	3.3	2.0
10	Andhra Pradesh	14.0	2.5	0.2	2.5	4.0	3.6	4.0
11	Uttar Pradesh	13.7	5.0	1.5	0.0	4.0	3.2	2.0
12	Lakshadweep	12.6	0.0	11.8	5.0	0.0	0.0	0.0
13	Himachal Pradesh	12.5	2.5	5.4	0.0	0.0	3.0	2.0
14	Goa	14.2	5.0	0.0	0.0	4.0	3.7	0.0
15	Karnataka	11.1	5.0	0.0	0.0	4.0	3.1	2.0
16	Punjab	12.7	2.5	0.0	0.0	4.0	2.8	2.0
17	Uttarakhand	13.6	0.0	0.0	0.0	4.0	3.6	2.0
18	Haryana	10.7	0.0	0.0	0.0	4.0	3.8	4.0
19	Gujarat	14.0	2.5	0.0	0.0	0.0	2.7	2.0
20	Tripura	13.6	2.5	0.0	0.0	0.0	0.0	4.0
21	Puducherry	13.8	2.5	0.0	0.0	0.0	3.2	2.0
22	Dadra & Nagar Haveli	15.0	5.0	0.0	0.0	0.0	0.0	2.0
23	Daman & Diu	11.8	2.5	0.0	0.0	0.0	0.0	2.0
24	Bihar	6.8	0.0	0.0	2.5	0.0	3.5	2.0
25	Andaman & Nicobar	12.9	0.0	0.0	0.0	0.0	0.0	2.0
26	NCT of Delhi	3.5	5.0	0.0	0.0	0.0	0.0	2.0
27	Manipur	1.8	0.0	0.0	0.0	4.0	0.0	2.0
28	Assam	7.9	0.0	0.0	0.0	0.0	0.0	2.0
29	Kerala	0.0	0.0	0.7	0.0	0.0	3.5	2.0
30	Chandigarh	0.0	0.0	0.0	0.0	0.0	0.0	2.0
31	Sikkim	0.0	0.0	0.0	0.0	0.0	3.9	0.0
32	Jammu & Kashmir	0.0	0.0	0.0	0.0	0.0	2.3	0.0
33	Ladakh	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: N-LRSI 2019-20, NCAER

Figure E.4: N-LRSI 2019-20 by its 14 Indicators

0-25 25.1-50 50.1-75 75.1-100 Note: All values in a component were rebased to 100, and colors were assigned in four scoring bands.

N-LRSI Rank		Registration		Quality of Land Records				
		Digital Attestation of Document by Sub Registrar office (SRO) (out of 4)	On-line Delivery of Registered Document (out of 4)	Updating Ownership (out of 5)	Extent of Joint Ownership (out of 10)	Land Use (out of 10)	Land Area (out of 10)	Recording Encumbrances (out of 5)
1	Madhya Pradesh	2.0	2.0	2.5	9.2	4.9	5.1	2.0
2	Odisha	2.0	2.0	1.3	9.2	9.3	5.6	1.0
3	Maharashtra	2.0	2.0	3.8	7.7	8.7	0.0	3.0
4	Chhattisgarh	0.0	0.0	2.5	9.4	6.5	5.0	1.0
5	Tamil Nadu	0.0	2.0	3.8	9.4	0.0	6.6	0.0
6	West Bengal	2.0	2.0	2.5	8.6	7.7	0.0	3.0
7	Jharkhand	0.0	0.0	3.8	9.6	9.2	5.6	3.0
8	Rajasthan	0.0	0.0	3.8	8.1	7.1	5.4	1.0
9	Telangana	0.0	0.0	2.5	10.0	7.4	0.0	1.0
10	Andhra Pradesh	0.0	2.0	1.3	9.6	0.0	8.2	2.0
11	Uttar Pradesh	0.0	2.0	3.8	8.3	7.9	0.0	1.0
12	Lakshadweep	0.0	0.0	0.0	9.0	0.0	8.3	1.0
13	Himachal Pradesh	0.0	0.0	3.8	7.0	8.0	1.5	2.0
14	Goa	0.0	0.0	2.5	8.9	0.0	0.0	3.0
15	Karnataka	2.0	0.0	2.5	9.2	0.0	0.0	2.0
16	Punjab	0.0	2.0	2.5	9.9	0.0	0.0	2.0
17	Uttarakhand	2.0	2.0	2.5	5.4	0.0	0.0	1.0
18	Haryana	0.0	0.0	3.8	7.2	0.0	0.0	2.0
19	Gujarat	0.0	0.0	2.5	8.4	0.0	0.0	3.0
20	Tripura	0.0	0.0	1.3	10.0	0.0	0.0	2.0
21	Puducherry	0.0	0.0	0.0	9.8	0.0	0.0	1.0
22	Dadra & Nagar Haveli	0.0	0.0	0.0	9.0	0.0	0.0	1.0
23	Daman & Diu	0.0	0.0	2.5	9.4	0.0	0.0	2.0
24	Bihar	2.0	0.0	1.3	9.7	0.0	0.0	1.0
25	Andaman & Nicobar	0.0	0.0	0.0	9.5	0.0	0.0	1.0
26	NCT of Delhi	0.0	0.0	0.0	8.6	0.0	0.0	3.0
27	Manipur	2.0	2.0	0.0	9.1	0.0	0.0	1.0
28	Assam	0.0	0.0	1.3	6.3	0.0	0.0	2.0
29	Kerala	0.0	0.0	2.5	0.0	0.0	0.0	2.0
30	Chandigarh	0.0	2.0	0.0	0.0	0.0	0.0	2.0
31	Sikkim	0.0	0.0	0.0	0.0	0.0	0.0	2.0
32	Jammu & Kashmir	0.0	0.0	0.0	0.0	0.0	0.0	2.0
33	Ladakh	0.0	0.0	0.0	0.0	0.0	0.0	2.0

Source: N-LRSI 2019-20, NCAER

Digitisation of Textual and Spatial Records

6. The extent of digitisation of land records was measured for both the textual records and spatial records (Cadastral Maps or CMs). The starting point was to understand the extent to which land records exist in relation to the total geographical area of a State/UT. The data collected for this revealed that in four States, land records in a written or digitised form are only available for a negligible proportion of their respective areas. These states are Mizoram, Nagaland, Meghalaya, and Arunachal Pradesh. The land records of Jammu & Kashmir and Ladakh are yet to be digitised and made available on the web. Sikkim and Chandigarh have not made the land records digitised by them available on the web. As a result, these six States/UTs were not assessed on the parameters relating to digitisation of land records. (This Index has been prepared for 28 States and 9 UTs, up to the re-organisation of Jammu & Kashmir and Ladakh).

7. The DoLR website reported that 31 States and UTs have digitised their textual records to varying degrees. This exercise revealed that:

i) As many as 28 States and UTs have digitised RoRs that can be accessed on the web; and

ii) In 19 States and UTs, the extent of digitised records is stated to cover more or less the entire area of the State/UT. In test-checks, this claim was found to be valid to the extent of 90 per cent or more for only 14 States and UTs (the area under forests was excluded from consideration).

8. The DoLR website reported that 26 States and UTs have digitised their spatial records to varying degrees. This exercise revealed that:

i) Only 14 States and UTs have digitised CMs that can be accessed on the web; and

ii) In four States and UTs, the extent of digitised CMs is stated to cover more or less the entire area of the State/UTs. In test-checks, the claim was found to be valid to the extent of 90 per cent or more for only one State/UT.

Availability of Legally Usable Copies

9. A basic service that a digitised land record facilitates is the citizen's ability to obtain copies of the record for various purposes. The information obtained through Knowledge Correspondents (KCs) about the extent to which legally usable copies of the RoRs can be accessed with ease, yielded the following information:

i) Nine States and UTs make available a legally usable digitally-signed copy of the RoR to anyone accessing the record on the web;

ii) Ten States and UTs make available a legally usable digitally-signed copy of the RoR through e-service centres; and

iii) Ten States and UTs still insist on a person visiting a departmental office for a legally usable copy of the RoR.

10. The information obtained through KCs about the extent to which legally usable copies of the CMs can be accessed with ease, yielded the following information:

i) Three States and UTs make available

a legally usable digitally-signed copy of the CMs to anyone accessing the record on the web;

ii) Three States and UTs make available a legally usable digitally-signed copy of the CM through e-service centres; and

iv) Eight States and UTs still insist on a person visiting a departmental office for a legally usable copy of the CM.

Figures E.3 & E.4 present the scores obtained by States/UTs in digitisation of textual records and the availability of legally usable copies; and those for digitisation of the spatial records, and the availability of legally usable copies.

11. An increase in the computerisation of the registration process is itself taken to be an indicator of improvement in the level of services available to clients since it both cuts down time entailed in availing of the service, and enhances transparency in the process. The N-LRSI measured the computerisation of the registration process with respect to digital availability of the following five stages:

i) Facility for online entry of data with regard to the proposed registration;

ii) Online updated circle rates;

iii) Facility for online payment of stamp duty/registration fee/e-stamp;

iv) Online verification of payment/ scrutiny of requisite details and completion of the registration process with digital signature; and

v) Immediate delivery of the digitally-signed registered document.

The assessment yielded the following results:

i) Four States and UTs have digitised all the above five stages;

ii) Five States/UTs have digitised four steps; seven States/ UTs have digitised three stages; six States/UTs have digitised two stages; nine States/ UTs have digitised only one stage of registration, and six States/UTs have digitised none of the stages.

iii) Twenty-three States/UTs have placed circle rates on the web. However, test-checks for availability of samples revealed that only five States/UTs had 90 per cent or more of the circle rates available online.

Figure E.4 presents the scores obtained by States/UTs in digitisation of the registration process.

4 States/UTs have digitized all five registration stages

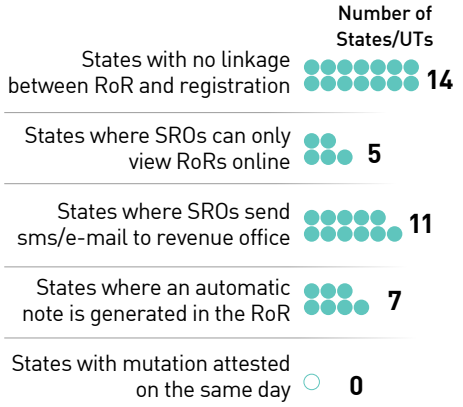
Quality of Land Records

12. In assessing the quality of the land records, the following five elements were analysed: Updating ownership, extent of joint ownership, land use, land area or extent, and recording encumbrances. All these elements bear a relationship with the incidence of dispute and the ease with which transactions in land are effected.

i) With regard to updating ownership, this exercise looked at how quickly a mutation is effected in the land records to reflect a change of ownership after the registration of a transaction of sale. The DoLR website reported 27 States and UTs carrying out an "instant" mutation. Data collected from the KCs, however, revealed that in five States/UTs, Sub-Registrar Offices (SROs) can only check the RoR online while carrying out the registration; in another 11

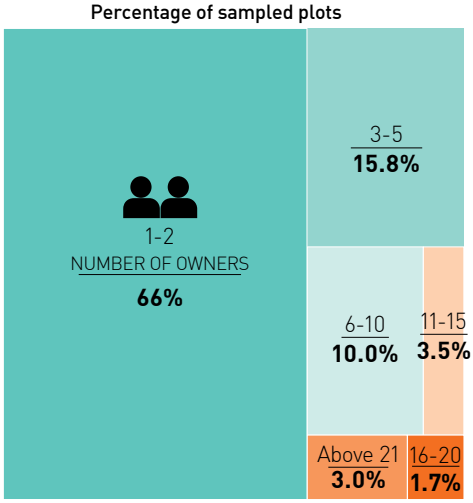
14 States/ UTs have no linkage between RoR & registration process

Figure E.5: Integration Between Registration and Land Records



Source: N-LRSI 2019-20, NCAER

Figure E.6: Extent of Joint Ownership



Source: N-LRSI 2019-20, NCAER

States/UTs, information is sent by SMS/e-mail to the revenue office responsible for entering the mutation, along with the provision to check the RoR online; while in another seven States/UTs, a note appears in the RoR automatically upon registration, in addition to the first two steps. *No State or UT reported an actual mutation being attested the same day and the change being incorporated in the record.*

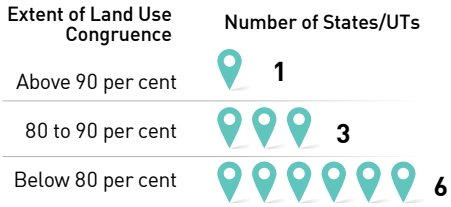
As many as 14 States/UTs do not have any form of linkage between RoRs and registration. Figure E.5 presents a summary of the status "integration" between land records and registration for States/UTs.

ii) It is generally accepted that a greater extent of joint ownership is likely to result in an increase in the time and effort entailed in transacting the concerned property. In one study, a higher incidence of joint ownership has also been seen to be inversely related to an accurate reflection of possession. The overall position which emerged from the samples checked, with respect to the differing percentages of owners, is presented in Figure E.6.

It may be noted that some States/UTs maintain their land records such that accounts are kept for single owners and plots are listed against their names. Sometimes, a plot-wise search can reveal instances of multiple ownership. However, it was not possible to verify instances of such multiple ownership in most of concerned States/UTs and till better data becomes available, these have been classified in the 1-2 owner category.

iii) For gauging the correspondence between the use reflected in the RoR and the on-ground situation, an attempt was made to see the sample plot numbers (obtained from digitised CMs) in Google maps of the area in order to assess if the actual land use on the ground matched that reported in the record. This exercise was possible only for States/UTs where the digitised land record is exhibited in mosaic form. Only 10 States and UTs met this condition. A summary of the results obtained from this test-check is presented in Figure E.7.

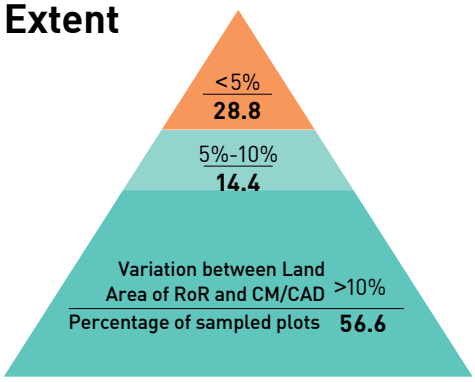
Figure E.7: Land Use Congruence



Source: N-LRSI 2019-20, NCAER

iv) For assessing the correspondence between the area or extent of plot numbers shown in the RoR and the on-ground situation, the proxy used was the area of the same plot in a digitised CM. This proxy could only be checked for States/ UTs where the digitised CMs were vectorised and the computed area values were accurately reflected on the CMs or at least the line lengths were available for computation. Only nine States/ UTs met this condition. A summary of the results obtained is presented in Figure E.8.

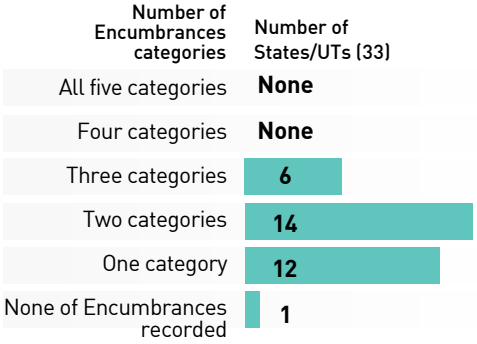
Figure E.8: Land Area/ Extent



Source: N-LRSI 2019-20, NCAER

v) Five types of encumbrances were identified with a significant incidence with respect to land. In order to find out if these conditions/restrictions are reflected in the land records, information on the orders obtaining in various States/UTs was collected through KCs. The number of States/ UTs reporting recording of the various encumbrances is presented in Figure E.9.

Figure E.9: Recording Encumbrances



Source: N-LRSI 2019-20, NCAER and State/UT sources.

Figure E.5 presents the scores obtained by States/UTs for the indicators of congruence between land records and the on-ground situation, as ascertained from the identified indicators.

None of the Indian States/ UTs record more than three encumb-rances categories

Ease Of Access To Land Records And Services

13. The digitisation of land records is of value only if those whom it is meant to serve can access the record with ease. An exercise was undertaken to assess the ease with which records can be accessed on various parameters. The exercise revealed that repeated attempts were required to retrieve RoRs in seven States/UTs, and to retrieve CMs in three States/UTs. In 12 States/UTs, there were instances of mis-matches in the spellings of village names in the land records portals. Only four States/ UTs had an on-screen 'Help/Frequently Asked Questions (FAQs)' facility to assist the users. The balance 25 States/UTs did not have any such on-screen aid, making it potentially difficult for users to figure out which tab to click, and where/how to look for information they wanted to obtain. Site translations (or bilingual, typically in

For 23 States/UTs, the urban land records are same as rural records

the local State/UT language and English) were available on the portals of West Bengal, Telangana, and Tamil Nadu only (Delhi had a portal with a mix of English and Hindi). Overall, a number of quick improvements for improving improve user access are possible in all the States/UTs.

Urban Records

14. This exercise also collected basic information on the availability of urban land and property records. A summary of the status of urban land and property records is presented in Figure E.10.

Prospects for Improvements

The N-LRSI 2019-20 results highlight the following areas of possible improvement in performance.

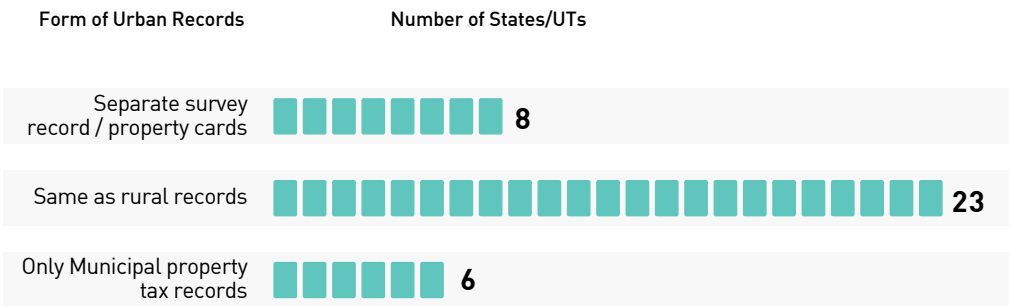
i) States and UTs can make quantum improvements by quickly surveying the unmapped inhabited areas and creating a record for these areas. This must include urban lands, a hitherto neglected category, which records a high intensity of transactions.

ii) The Government of India needs to consider ways of standardising the terms and indicators against which the States and UTs can upload authenticated data, and whence a central portal like that of the DoLR can pick up real-time data for collation and reporting.

iii) Other areas where States and UTs can rapidly improve their digitisation include real-time attestation of mutations; linking databases like birth and death registers and genealogical tables (attached to RoRs in some States/UTs); recording tenant possession of rented built-up properties; noting civil court litigation; and reflecting changes in land use or start of acquisition or planned changes in land use.

iv) Some States and UTs provide leadership in the specific dimensions that others can profitably follow without having to go through the whole process again. These include easily navigable websites and up-to-date portals to assist clients; virtual registration (for example, as started by Maharashtra); the linkage between RoRs and registration databases to generate a note in the textual records on the registration of a property transaction; recording all ownership in built-up vertical spaces like apartment blocks; and linking records of cooperative societies or drawing

Figure E.10: Availability of Urban Land Records



Source: N-LRSI 2019-20, NCAER

on municipal property tax records. States/UTs need to hasten digitisation of the spatial record and giving legal legitimacy to the area actually recorded where it shows greater congruence with the on-ground situation than the area noted in the RoR. Some States and UTs appear to have made progress in linking the institution of revenue court cases with the textual records and other States/UTs can follow this lead. States/UTs that have digitised records and are yet to make these available on the web, need to do this on a priority basis.

v) For the Government of India, the N-LRSI offers a great opportunity in many aspects. At the minimum, it can help the Government seek better quality while attempting the updation of information on the DoLR websites by States/UTs. The States/UTs can be requested to make updation a real-time exercise by standardising the links to relevant databases. States/UTs can also be requested to carry out more quality checks of their records. Most important, the GoI can explore approaches for rewarding and recognising States/UTs that perform better on this Index so that the others are incentivised to improve and race beyond the front-runners.

N-LRSI 2019-20 and 2020-21

The first round (2019-20) of construction of the N-LRSI primarily used supply-side data (and proxies for measuring the access for preliminary citizens) for assessing the extent of digitisation and gauging the quality of land-records- related services offered. For the second round (N-LRSI 2020-21), a demand-side survey of citizens is proposed to be added to gauge the level of public awareness and appreciation of the digitisation process, and the services it has enabled, as elicited by a primary survey of users. This may also occasion a change in weightage of the components of the Index since many States/UTs will be able to show rapid progress in increasing coverage and improving accuracy.

The Index is timely and now poised to attract the attention of the relevant stakeholders. If it gains traction from the Government of India, States/UTs and citizens at large, the Index could become a bellwether of improved land governance in India.

GoI can explore approaches for rewarding and recognising States/UTs that perform better on N-LRSI so that the others are incentivised to improve and race beyond the front-runners

CHAPTER

1

INTRODUCTION

The Indian economy has slowed down dramatically over the years 2018 and 2019. Financial analysts and commentators have increasingly pointed out that the slowdown is a structural rather than a cyclical phenomenon. Attention to reform in the hitherto neglected areas has been posited as one of the critical steps required for India to resume a high-growth trajectory. In this context, land (and labour) are the most-cited sectors for undertaking these reforms. The continued lack of improvement in the ability to acquire and hold land, and transact in land and property, are cited as major impediments inhibiting both investment and poverty reduction. India's spectacular improvement on the overall index of Ease of Doing Business (EoDB), compiled by the World Bank, stands in marked contrast to the dismal showing with regard to the component of the index that relates directly to land (World Bank, 2019). Commentators have recommended acceleration in the mapping of land, improving titling, registering of changes in ownership, as well as transparent processes to determine and alter land zoning. (*India Today*, 2019).

The importance of accurate and up-to-date land records has been recognised by the Government of India (GoI) since 1987-88 (DoLR, 2019), when a national programme was launched for States and Union Territories (UTs) to strengthen their revenue administration and computerisation of land records. However, despite three decades of implementation of successive programmes, studies indicate a mixed record of the impact of the digitisation of land records and the registration process across States/UTs. Therefore, this exercise sought to assess the reality across the States/UTs, and to determine where the progress was significant, where gaps were most visible, and what could be done to improve the situation. Presenting a comparative picture across States/UTs on an annual basis may instil a sense of competition and create an incentive for the States/UTs to do better. Identifying and displaying the gaps along various dimensions may also help States/UTs to implement specific remedial actions. The NCAER Land Records and Services Index (N-LRSI) has been prepared to achieve these fundamental objectives.

1.1. Importance of Improving Property Record Systems

Land is the most important income-earning asset for many people around the world and therefore, reforming property rights is an important issue, especially in developing countries. Globally, India is among the world's most land-scarce countries relative to population. By 2050, the land per capita in India is expected to decline four-fold, whereas China will have four times more land per capita and Brazil some 20 times (NCAER, 2017). Land-related disputes in India account for about 60 to 70 per cent of all civil litigation. About 25 per cent of all cases decided by the Supreme Court involve land disputes, of which 30 per cent concern disputes relating to land acquisition (Wahi, 2010). The large number of land parcels that are subject to legal disputes and unclear titles, make tenure insecure for a large number of poor and vulnerable people, create a sense of insecurity in the business climate, discourage new investment, and pose a challenge for governance.

The real estate sector, constituting about 11 per cent of India's GDP, is characterised by an extremely inefficient property market and is a commonly-used means of parking unaccounted-for money (CBDT, 2012). The Standing Committee on Finance

By 2050, the land per capita in India is expected to decline four-fold, whereas China will have four times more land per capita and Brazil some 20 times

Huge ground needs to be covered in achieving accuracy and real-time updation of India's land records, before the country can start entertaining visions of moving towards conclusive titling

(2015) also suggested that the challenge of generation of black money through *benami* transactions could be addressed by digitisation of land records and their regular updation. Recent surveys have found that land and property departments in a number of States/UTs are the focus of bribes and corruption (India Corruption Survey, 2019).

It is important to protect property rights because it helps the economy deal with the issue of resource scarcity by ensuring that its use is regulated through ownership. The several million cases relating to land disputes pending in the courts in India are due in part to the lack of comprehensive, up-to-date land records. Promoting the security of property rights and land titles is not only a fundamental requirement for land markets to function efficiently but is also essential for achieving robust economic activity in agriculture (enabling access to much-needed credit), manufacturing or services (enabled by land and associated infrastructure). Proper land records ensure security of tenure for small farmers, and for the poor and vulnerable in rural as well as urban areas. The improved functioning of land markets is bound to help in streamlining compensation when land is acquired which, in turn, will boost the ease-of-doing-business as land is a significant resource for industrial activity.

In 2017, NCAER and partner institutions, supported by the Omidyar Network (ON), carried out a pilot impact assessment of the national flagship, Digital India-Land Records Modernisation Programme (DI-LRMP). These impact assessments found that huge ground needs to be covered in achieving accuracy and real-time updation of India's land records, before the country can start entertaining visions of moving towards conclusive titling. According to the above NCAER report, rushing to achieve conclusive titling across the nation in the context of still incomplete land records and inchoate state capacity to deal with these gaps in record-keeping, could spell disaster and push land markets into chaos, particularly for small-holder land parcels. Indeed, rather than reducing land litigation, a premature legislative jump without due preparation could lead to more land litigation rather than less, with the concomitant adverse economic and social impacts. There is thus a need to take stock of what has been done, where the gaps persist, what can be done to leverage greater gains from the efforts already made, and how a realistic plan can be developed and implemented for achieving the objectives.

Digitisation is the key to improving land records and services in India, as it eliminates redundant labour and human error even while it makes it easy to update the records. It allows for better servicing of clients by enhancing access to the records and connected services, and can become a stepping stone to further improvement by enabling analysis to guide policy for facilitating real-time accuracy. A web-enabled "anytime-anywhere" access saves the citizen time and effort in obtaining copies of the records. Automatic and automated mutations by eliminating the gap between registration of a transaction and its entry in the property record can significantly reduce the scope of fraudulent property deals. Computerisation of registration is necessary not only for making property registration efficient and hassle-free but also for integrating land records management with the registration process. Digitised processes to enable entry of registration data, calculation of the taxes due and making payments, and use of online systems to approve registration and deliver final documents, reduces not only client interface with the registration machinery but the latter's involvement in the entire process.

Apart from being digitised, land records need to accurately reflect the on-ground reality. In many cases, land (and property) records are maintained across different departments and agencies, and may, therefore, contain mismatches or may not have been updated properly (Prachi and Mishra, 2017). In such a situation, discrepancies are often noted in land records due to which the property documents in several records do not match the position on the ground. Such a process is not only inefficient and time-consuming but also affects future property transactions. Thus, it is important for land records to mirror the situation on the ground and reflect changes happening on a real-time basis.

1.2. Digitisation of Land Records: Efforts and Achievements

Historical Efforts towards Computerisation of Land Records in India

The Government of India first introduced programmes focusing on computerisation of the land records in the 1980s. These included: (i) Strengthening of Revenue Administration and Updating of Land Records (SRA and ULR), and (ii) Computerisation of Land Records (CLR), which were started in 1987-88 and 1988-89, respectively. In 2008, the Department of Land Resources in the Ministry of Rural Development merged the two land record computerisation schemes to launch the flagship National Land Records Modernisation Programme (NLRMP). Although it began as a Centrally Sponsored Scheme (with joint Central and State funding), the programme has since been recast as a Central Sector Scheme with the GoI providing 100 per cent funding. The immediate objective of the programme is to establish a modern, efficient land records management system in the country with real-time updation of land records. The ultimate aim of the programme is to create a system of conclusive titling for ensuring conclusive proof of ownership of a property. The programme components include funding for digitisation of textual and spatial records as well as registration systems. The programme was brought under the ambit of the 'Digital India' programmes in 2016 and has since been re-designated as the 'Digital India Land Records Modernisation Programme (DILRMP)'. Box 1.1 traces the evolution of the Government of India's efforts at promoting computerisation of land records (NCAER, 2017).

The NLRMP programme has been re-designated as the 'Digital India Land Records Modernisation Programme (DILRMP)' in 2016

Reported Physical Progress

The DoLR portal synthesises data on land records for States and UTs. The

Box 1.1: Historical Efforts towards Digitisation of Land Records

Source: NCAER Report on 'Pilot Impact Assessment of the Digital-India Land Records Modernisation Programme' 2017.

Overall, 26 States/UTs have made significant progress towards digitisation of their textual land records, while 23 States/UTs have made significant progress in digitising spatial records

position on the DoLR portal (accessed on December 01, 2019) for the 37 States and UTs is presented in Annexure Table A1.1. The DoLR portal highlights the following achievements of the programme:

Land Records Digitisation: Twenty six States/UTs reported having completed 75 per cent of the digitisation of their textual land records. Of these, four States/UTs, that is, Dadra & Nagar Haveli, Lakshadweep, Odisha, and Sikkim have reported 100 per cent digitisation. The States/UTs in the incipient stages of digitisation include Nagaland, Mizoram, Manipur, Arunachal Pradesh, Meghalaya, Jammu & Kashmir, Ladakh, and Chandigarh.

Digitisation of Cadastral Maps (CMs): Twenty-two States/UTs report having completed more than 80 per cent of the digitisation of cadastral maps. Eight States/UTs are yet to make a start. Among the rest, the poorest performing States/UTs are Uttar Pradesh, Rajasthan, Andaman and Nicobar Islands, Gujarat, and Maharashtra, which have reported only up to 15 per cent of progress.

The reported physical progress made towards digitisation of land records can be summarised as follows:

- **Computerisation of Land Records:** This refers to the digitisation of textual records. The standards of digitisation that are expected to be achieved, are provided in the DI-LRMP Guidelines, and the Technical Manuals and MIS (2018-19) issued by the DoLR, GoI. The DI-LRMP Guidelines mandate that all textual data including the Record of Rights (RoRs), mutation orders, and other land attributes need to be updated and computerised. All pending mutation orders need to be incorporated in records and the data entry pertaining to these needs be completed on a priority basis. The tasks entailed as part of this process are to: simplify/amend/revise/prepare the land records, manuals, RoR formats; standardise the codifications, and feature codes, among other things; confer legal sanctity to the computerised land record extracts as the official records; and discontinue manual land record writing and the issuing of hand-written copies of the RoRs once the computerised system stabilises. The latest status indicates that Arunachal Pradesh and Meghalaya are the only States/UTs where no progress has been made. Jammu and Kashmir, Ladakh, Manipur, Mizoram, and Nagaland have begun the process of digitisation. Other States/UTs report having made significant progress.

- **Digitisation of CMs:** This refers to the digitisation of the spatial record and here again, the standards of digitisation expected to be achieved are provided in the DoLR manual. The DI-LRMP Guidelines mention that in most parts of the country, the land parcels depicted in the village maps are covered in one or more sheets, depending upon the scale of mapping and area of the village. These village maps/sheets need to be considered as the basic input for digitisation and 'mosaicing' of the cadastral maps in these States/UTs. In other States/UTs, where ladder data or gat maps/tippans/Field Measurement Books (FMBs) are used, the same will be taken for digitisation and further mosaicing of the maps. Overall 23 States/UTs report having made significant progress in the digitisation of CMs, of which 10 States/UTs have fully digitised their CMs. Six States/UTs, viz., Maharashtra, Gujarat, Andaman and Nicobar Islands, Rajasthan, Uttar Pradesh, and Uttarakhand are still in the initial stages, while the remaining eight States/UTs have made no progress.

- **Integration of CMs with RORs:** According to the DoLR Guidelines, the

GIS-ready digitised CMs need to be integrated with the corresponding textual details of the RoR. Integration of the spatial database with the textual RoR data involves the following process:

1) Each plot of land is represented on the digital map as a closed polygon wherein each polygon is identified by a unique plot number. In the textual RoR database, each plot is also referenced by this unique plot number. This provides a basis for integration of digital map data with the textual RoR data.

2) The basic textual RoR database consists of several tables which provide information on ownership, and land classification, among other things. All the tables are linked by certain common data fields.

The DoLR portal shows that overall 24 States/UTs have made efforts in this direction, of which 10 States/UTs have made significant progress, particularly Odisha, Tripura, Goa, West Bengal, and Chhattisgarh. In the remaining 13 States/UTs, there is no report of initiation of this work.

- **Computerisation of Registration:** Under the DI-LRMP, the process of computerisation of registration includes:

a) Computerisation of the Sub-Registrar's Offices (SROs);

b) Data entry of valuation details;

c) Data entry of legacy encumbrance data;

d) Scanning and preservation of old documents; and

e) Connectivity of SROs with revenue offices.

The DoLR portal shows that the seven States/UTs of Arunachal Pradesh, Jammu & Kashmir, Ladakh, Karnataka, Lakshadweep, Mizoram, and Nagaland have not yet started the digitisation of SROs, while the States of Meghalaya, Manipur, and Chhattisgarh are at an initial stage of doing so. The remaining 27 States/UTs have reported a significant level of achievement, of which 15 States/UTs have fully digitised their SROs.

- **Integration of Land Records and Property Registration:** According to the DI-LRMP Guidelines, it is necessary to integrate the registration process with the land records maintenance system so that mutation notices and mutation remarks in the corresponding RoRs can be generated automatically after registration. Nineteen States/UTs are reported to have made significant progress in this regard. Six other States/UTs, viz., Uttarakhand, Bihar, Tamil Nadu, Chhattisgarh, the Andaman & Nicobar Islands, and Punjab have made a start. The remaining 12 States/UTs are yet to initiate action on this front.

(Please refer to Annexure Table A1.1 for details.)

Financial Progress

Since the inception of the CLR scheme in 1988-89, 583 districts in the country were covered under the programme, up to 2007-08. Further, since the inception of the scheme, the Ministry had released a total amount of Rs 586.61 crores for its implementation by March 31, 2008. The utilisation of funds by the States/UTs during this period was reported to be is Rs 536.41 crores, or approximately 91 per cent of the total funds released.

Since the launch of NLRMP in 2008-09, the Department of Land Resources had released a total amount of Rs 1167.4 crores

As per DOLR data, 27 States/ UTs have reported a significant progress towards digitisation of SROs, of which 15 States/ UTs have fully digitised their SROs

Of the total amount released by the Central Government for the DI-LRMP, only 11 per cent have been utilised till date

up to 2015-16. This amount was targeted to cover 457 districts, and an amount of Rs 525.3 crores or 45 per cent of the total was reported to have been utilised by the States/UTs.

According to the latest estimates (GoI, 2020), a sum of Rs 1,936.2 crores has been sanctioned for the DI-LRMP. As on February 5, 2020 about 61 per cent of the sanctioned funds, that is, a total of Rs 1,181.6 crores has been released by the Central Government. This ostensibly includes the sanctioned amount over the period 2008-09 to 2015-16 (Rs 1,167.4 crores). Of the total amount released, Rs 133 crores or 11 per cent is reported to have been utilised (as of February 5, 2020).

(Please see Annexure Table A1.2 for financial progress.)

1.3. Rationale of the N-LRSI

Overall, the digitisation efforts appear to have had a mixed impact going by the achievements reported by the States and UTs on the DoLR website. The actual picture on the individual websites of the respective States/UTs is, however, often different from that reported on the DoLR website. In this context, devising a monitoring tool to help demonstrate the difference in performance by States/UTs, as also to derive lessons from them and foster competition in a "race to the top," can act as an important platform to encourage performance, reward progress, and censure inaction by the States/UTs in this sphere. The rationale for this exercise of creating an Index for Land Records and services has therefore been derived from this composite understanding.

Accordingly, the N-LRSI 2019-20 was developed to answer the following questions for all States and UTs in India:

- What is the actual extent of digitisation of land records and the registration process?
- What is the level of improvement in land record services brought about by this digitisation process?
- What is the improvement in the quality of land records brought about by the digitisation process?

The idea of constructing this index was mooted in the recommendations emerging from the DI-LRMP Impact Assessment undertaken by NCAER and partner institutions in 2017. The pilot Impact Assessment yielded the lessons that have informed the design of the N-LRSI. The Study established that it is possible to test-check the status of digitisation reported by each State/UT based on the records made available on the Internet. The extent of ease of accessing a basic service like obtaining a copy of the record, can be established by verifying the mode whereby citizens can access legally useable copies of the record. Similarly, the extent of improvement in the registration process can be understood by verifying the progress in computerising the various stages needed to complete the process of registering a transaction.

The challenges relate to checking for the quality of the land record. For a check of accuracy, it is not practical to undertake physical verification on the ground across the country in every State and UT. Both the time and cost implications of such an endeavour, using a sample large enough to command credibility, would be prohibitive. There is thus a need to develop indicators that could look at the core qualities of an inherently good land/property record, viz., timely updation of ownership details, reduced extent of joint ownership, accurate reflection of the area or extent of the land/property, precise recording of the

use to which it is put, and identification of all encumbrances surrounding it. The primary challenge therefore, was to design an assessment system that could provide answers on the quality of the land records through reliance on the available digital databases and information sources.

a) This index groups the weighted indicators in the ratio of 60: 40 to measure:

b) The extent of computerisation of land records and registration, as well as improvement in delivery of frequently used services; and

The extent to which the record possesses features that are likely to reflect an improved quality of land record with timely updation of ownership data, extent of joint ownership, actual land use, area, and record of encumbrances.

The details of the various parameters used in constructing this index and the weights assigned are explained in Chapter 2.

The N-LRSI is expected to credibly capture both the supply-side and demand-side dimensions of land record-related services in each State/UT, and thereby spur individual States/UTs to improve their respective standings in the N-LRSI rankings. The goal is to promote a race to the top among Indian States/UTs in land record modernisation. Such a race will improve the business climate, reduce litigation, unlock the rural and urban value in land, and better protect vulnerable groups. The N-LRSI will, it is hoped, incentivise States/UTs to improve land record systems and thereafter keep maintaining them well to ensure that the improvements sustained. The ranking of States/UTs on the N-LRSI can be used to reward better-performing States/UTs, thereby driving more outcome-based funding. Such incentives would be consistent with India's current focus on competitive federalism. The Index could also prove to be a significant step towards achieving the goal of effective land record management and conclusive titling.

The N-LRSI is expected to credibly capture both the supply-side and demand side dimensions of land record-related services in each State/UT, and thereby spur individual States/UTs to improve their respective standings in the N-LRSI rankings

CHAPTER

2

METHODOLOGY AND PROCESS

The construction of the N-LRSI entailed both methodology- and process-related challenges. On the methodological front, the question that needed to be addressed in the first instance related to selection of appropriate parameters. The second issue was to ensure that the data sources used had the requisite credibility in measuring performance on these parameters. In test-checking data from Internet sources, a third methodological issue related to estimation of the universe and drawing of statistically representative samples. As regards the process, what appeared to be a reasonably straightforward set of steps in the beginning, in terms of how the samples would be test-checked or how the other information would be gathered, later presented many unforeseen hurdles. This necessitated changes in the steps of the process steps, and in some cases, even tweaking of the methodology. This chapter delineates the methodology and process adopted in constructing the Index.

2.1 Methodology for Constructing the N-LRSI

The N-LRSI has been constructed to award a maximum of 100 points to measure the performance of each State/UT on the parameters being measured. The parameters, their assigned weights and the mode of securing information for evaluating performance, are presented in Table 2.1.

Assessing the Extent of Digitisation

I. Digitisation of the Textual Record:

a) The total land area of the State/UT for which detailed land records ought to exist is assumed as the total area of the State/UT minus the area classified as forest land. The data has been obtained from the relevant State/UT websites and the KCs.

b) Out of the net area calculated in item a) above, the proportion of land area for which no record of rights (textual record) is said to exist, was calculated from the data obtained from the State/UT websites/KCs; and deducted from the maximum of 15 points set aside for digitisation of land records.

c) The proportion of revenue villages for which the textual records are not digitised was calculated from the data on the DoLR website/State/UT websites/KCs (taking the highest figure reported by all sources) and further deducted from the 15 points set aside for digitisation of land records.

d) Finally, the proportionate figure of villages failing the dipstick test check (of one random khasra number showing up in the village record) out of the total number of villages that were selected for the dipstick test check, was subtracted from the 15 points set aside for digitisation of land records.

e) For assessing the availability of legally useable copies of the textual record, the KC was the principal source of information. If the KC reported that for a State/UT, the record was available in a legally useable form, either free or by making a payment through an Internet-based gateway, then no deduction was made out of the 5 points allocated for this purpose. If copies of the record were available through a network of e-service centres, then 2.5 points were deducted. If the record was available only through a department office, then no points (zero) were awarded under this item.

The N-LRSI has been constructed to award a maximum of 100 points to measure the performance of each State/UT on the parameters being measured

Table 2.1: N-LRSI Parameters, Weights and Mode of Evaluation

(Maximum points =100)

PARTICULARS	POINTS	EVALUATION METHOD: Desk research	KCs	Test Checks
TEXTUAL RECORD				
a. Digitisation of Records of Rights (RoRs)	15	●	●	●
b. Availability of legally useable copies of RoRs	5	○	●	○
SPATIAL RECORD				
a. Digitisation of Cadastral Maps (CMs)	15	●	●	●
b. Availability of legally useable copies of CMs	5	○	●	○
REGISTRATION				
a. Public Entry of Data	4	●	●	○
b. Availability of Circle Rates	4	○	○	●
c. Mode of Payment of Stamp Duty / Registration Fee	4	●	●	○
d. Digital Attestation of Document by Sub Registrar office (SRO)	4	○	●	○
e. On-line Delivery of Registered Document	4	○	●	○
QUALITY OF LAND RECORDS				
f. Updating Ownership	5	○	●	○
g. Extent of Joint Ownership	10	○	○	●
h. Land Use	10	○	○	●
i. Land Area	10	○	○	●
j. Recording Encumbrances	5	○	●	○

NOTE: KCs – Knowledge Correspondents (KCs were contacted under this exercise to obtain and advise on specific questions about the status and process of land records in the States/UTs; and they variously comprised senior officers, other retired and serving revenue officers and/or experts with knowledge of land matters in the relevant State / UT.)

SOURCE: N-LRSI 2019-20, NCAER

II) Digitisation of the Spatial Record:

The same methodology described above for the textual record has been adopted in the case of the spatial record.

III) Digitisation of Registration Process:

The construction of the N-LRSI required measuring the computerisation of the registration process with respect to digital availability of the following five stages:

a) **Facility for online entry of data with regard to the proposed registration:** If desk research showed or the KC reported the availability of a data entry portal for filing details of the proposed registration, then the State/UT was awarded the maximum of 4 points allocated for this purpose. If no such facility was available, no points were awarded to the State/UT.

b) **On-line updated circle rates:** The percentage of towns and villages in the State/UT for which circle rates are not notified was calculated and deducted from the maximum of 4 points. Thereafter, the proportionate failure rate in test checks was deducted.

c) **Facility for on-line payment of stamp duty/registration fee/e-stamp:** If desk research or information provided by the KCs showed that no online payment system or any other mechanism was available for online payment or the purchase of e-stamps and the traditional mechanism of stamp paper to be purchased from stamp vendors or the government treasury was in use, then no points were awarded under this head. If there was an e-stamp purchase mechanism, then 2 marks were awarded to the State/UT; whereas if there was an online system (for example, E-Gras) then the maximum of 4 points were awarded to the State/UT.

d) **On-line verification of payment/ scrutiny of requisite details and completion of registration process with digital signature:** If the facility existed and was compulsory for the SRO, then the maximum of 4 points were awarded, subject to a deduction for the proportion of SROs in the State/UT not covered by this facility. If the facility was optional, then only half the points were awarded, again subject to a deduction for the proportion of SROs in the State/UT not covered by this facility. In case no such facility was available, then no (zero) points were awarded.

e) **Immediate delivery of the digitally signed registered document:** If the facility existed and was compulsory for the SRO, then the maximum of 4 points were awarded, subject to a deduction for the proportion of SROs in the State/UT not covered by this facility. If the facility is optional then only half the points were awarded, again subject to a deduction for the proportion of SROs in the State/UT not covered by this facility. In case no such facility was available, then no (zero) points were awarded.

B. Assessing the Quality of the Land Records

In order to evaluate the second part of the N-LRSI, that is, the quality of the land records, the following five elements have been considered:

1. Updating ownership: The updating of ownership in the land records has been assessed on the basis of the information provided by KCs on the real-time linkage between the digitised textual records and the registration of transactions. Points have been awarded with respect to the

following four stages: if SROs can only check the RoR online while carrying out registration (1.25 points); if information is automatically sent by SMS/e-mail to the revenue office responsible for entering the mutation (2.5 points); on registration, an automatic notation appears in the RoR (3.75 points); and if mutation is attested on the same day (5 points).

2. Extent of joint ownership: Ideally an accurate record should capture actual possession over property. This is rendered difficult in India by the fact that in a large number of States/UTs, possession is not recorded in the RoR (for details refer to Figure 6.2 in Chapter 6). In most other States/UTs, it is routinely stated as being the same as ownership. Securing an accurate reflection of possession without actual surveys in difficult. One possible proxy is the incidence of joint ownership. An earlier NCAER study that assessed the accuracy of the land records in the state of Himachal Pradesh (NCAER, 2017) revealed that in 49 per cent of the sampled plots, there was a variation in the actual and recorded possession. These 72 per cent of the cases were those where all shareholders were recorded but actual possession was with a lesser number of the recorded shareholders (NCAER, 2017). This highlighted the significance of the extent of joint ownership as a reflection of actual possession—fewer owners are more likely to reflect possession accurately. While the significance of this relationship is yet to be widely demonstrated, it is intuitive that a record showing a high degree of joint ownership is likely to pose greater difficulty for transactions in land. Therefore, the textual records of States have been checked for the incidence of joint ownership. Assuming that fewer owners reflect a better situation for the proportion of up to two owners, no deduction has been made from the allocated 10 points. The proportion of 3–5 owners has meant a 20 per cent penalty, 6–10 owners, a 40 per cent penalty, 11–15 owners, a 60 per cent penalty, 16–20 owners, an 80 per cent penalty, and the proportion with over 21 owners has been penalised to the extent of 100 per cent.

3. Land use: The accuracy of recorded land use was assessed by taking the use shown in the ROR and comparing this with the satellite image of the concerned plot. This is possible only if the Cadastral Maps (CMs) are digitised and available in a mosaic form permitting identification of the prominent physical features in order to fix the location of the plot for viewing on the satellite imagery. The States/UTs where cadastral maps were not digitised or available in a mosaic form were given a score of nil on this parameter. It may be noted that digitising CMs in a mosaic format is an important DILRMP objective of the DILRMP. For the other States/UTs, the score for proportionate failure in the tests was deducted from the 10 points allocated for this purpose.

4. Extent/area: The accuracy of the area shown in the RoR was assessed by comparing the figure for sample plot numbers with the area shown for the same plot numbers in the digitised CM. However, in the States/UTs, where digitised CMs do not reflect the actual measurement but reproduce the area given in the RoR, this data was used but the line lengths of the vectorised maps were recorded to compute the actual area as per the digitised CM. In case of States/UTs, where the area cannot be computed and is shown to be the same as in the RoR, they have been treated on the same plane as the States/UTs without digitised CMs and not scored on this parameter (awarded zero). Where the sample check was actually possible, proportions in the sample with a variation within a range of 5 per cent were not subjected to any penalty. Proportions

of variations of above 5 and up to 10 per cent attracted a penalty of 20 per cent, of above 10 and up to 15 per cent were given a penalty of 40 per cent, of 15–20 per cent variation were awarded a penalty of 60 per cent, of 20–25 per cent were penalised to the extent of 80 per cent, and 25 per cent variations attracted 100 per cent penalty.

5. Encumbrances or restrictions/ conditions attached to the property: It is generally understood that encumbrances/restrictions or conditions that may be attached to land are of five prominent types: mortgages, ongoing land acquisition proceedings, town planning-related restrictions on land use or buildings, proceedings in revenue courts and proceedings in civil courts. In the case of mortgages, there is an established practice of entering this encumbrance in the record in most States/UTs. However, the practice of enabling this entry on a real-time basis is relatively recent. This is enabled by either allowing the banks/ financial institutions (extending the loans), a facility to make an entry in the record, or where mortgages are compulsorily to be registered, the automatic noting of the registration event can take place in the record (if the registration process is linked to the land record). The software linkage to enable real-time notation in the land record in the case of the other four types of restrictions mentioned above, is still in its infancy. Given this status, one point was awarded for each of the five encumbrances, if the KC reported that instructions had been issued in the State/ UT for the encumbrance to be reflected in the RoR either through the linkage of relevant databases or by manual entry.

2.2. Sample Design and Methods

For the construction of this Index, a nationally representative sample was required that would adequately capture the various components. Based on a series of consultations with experts, three separate sampling strategies were adopted, as discussed below.

Strategy I: Extent of Digitisation of Land Records: To evaluate the extent of digitisation of land records in terms of the RoRs and CMs, all the districts reporting digitisation of land records form part of the sample. Thereafter, a three-stage stratified random sampling approach was adopted wherein, at the first stage, tehsils were selected through PPS[1] (Probability Proportional to Size), followed by selection of villages at the second stage through circular systematic random sampling, and of *khasra*/plot numbers at the final stage through simple random sampling. (Please see Box 2.1 for the detailed sampling framework and the Annexures for sample details). For RoRs, the sample comprised 32,576 villages in 2,750 *tehsils* (602 districts). For CMs, the sample comprised 14,227 villages in 1,889 *tehsils* (402 districts).

Strategy II: Online Availability of the Registration Process: To draw the sample for testing the five identified stages of the registration process, preliminary desk research was conducted, which showed that the online system is available in some States/UTs for use by the public for the first three stages of the registration process. The last two stages involve activities that

A three-stage stratified random sampling approach was adopted to test check the extent of digitisation of land records

1 Probability proportion to size (PPS) is a sampling procedure under which the probability of a unit being selected is proportional to the size of the ultimate unit, giving larger clusters a greater probability of selection and smaller clusters a lower probability.

An appropriate sample was drawn for online verification of circle rates, whereas for other four stages of registration, the process followed was largely a combination of desk-based research and procurement of information from KCs

occur after the public interface and are, therefore, accessible only in-house for online verification and delivery. For the second stage of registration (circle rates), the universe was identified that would be made the subject of the test-check, and an appropriate sample size was drawn for online verification. The sample comprised 2670 *tehsils* covering 31,354 villages (581 districts). For the other four stages, the process followed was largely a combination of desk-based research and procurement of information from KCs.

Strategy III: Assessing the Quality of the Land Records: To test the five elements selected for this purpose, the same sample districts and *tehsils* were selected as for Sampling Strategy I. Thereafter, one headquarter village was selected from each sample *tehsils* presuming that, other things being equal, in a given area, these villages would reflect the maximum changes in land transfer and land use over time. The identification of actual headquarter villages involved the following approach: i) if the village name as given in the State/UT data available on the DoLR website was identical to the *tehsils* name, it was selected, or else, ii) using Google Maps Pro Software, the respective *tehsils* map was plotted and based on the distance from the *tehsils* headquarter and availability of certain infrastructural properties such as roads, canals, and post offices, a village was selected subject to the condition that the identified village name also appeared in the DoLR database. Finally, from each headquarter village, 5 *khasra*/plot numbers were selected using the systematic random approach based on the maximum range of *khasra* numbers available in the village. Since this range was not always readily available, the following approach was adopted to overcome this difficulty: i) the range was taken from the drop-down option listing all plots in the State/UT websites or; ii) the Census 2011 household data of the village was adopted as the range. However, in the latter case, it was reported that in some instances, the number of households exceeded the number of plots in a village. In such cases, the highest sampled Census household number found to have a corresponding plot number in a village was taken as the upper limit and samples were redrawn for the respective villages accordingly. For assessing the extent of joint ownership, 13,750 plots in 2,750 villages (one in each *tehsils*) from 602 districts were test-checked. For land use, test checks were conducted in 10 States/UTs, in 3,282 plots; and land area was tested in nine States/UTs in 2,679 plots.

2.3 Process of Online Test Checks

The samples drawn on the basis of the strategies described above were subjected to random test checks online. The process adopted for performing online test checks to assess the extent of digitisation of land records and the registration process and quality of the record has been detailed below.

Test Checks for Extent of Digitisation of Land Records: To gauge the extent of digitisation of land records in a State/UT, village wise dipstick tests[2] were conducted for checking the online availability of RoRs and CMs.

Test Checks for the Registration Process: As mentioned in the preceding discussion on sampling strategy, test checks were undertaken for the online availability of circle rates in the sampled villages of a State/UT. However, for the

2 The dipstick survey is a 'one-time' or "one-point" test exercise undertaken to answer a specific question, for e.g. in this case it was whether digitisation was completed in respect of land records in the village. This test made the assumption that if a random plot selected was digitised, all the other plots are also likely to have been digitised as the digitisation effort would at least cover a complete revenue village.

other four stages of data entry, online payment of stamp duties, completion of the registration process with digital signatures, and immediate delivery of the registered documents, verification was done based on either desk research or information gathered from the KCs (for details, refer to the Annexures).

Test Checks for Quality of the Land Records: To assess the quality of the land records pertaining to the five elements identified, it was decided to test-check the appropriate proxy indicators to be drawn from the digitised record (not on the actual physical verification). For this, the KCs were asked to collect and report on the practices and status in various States/UTs (for details, refer to the Annexures).

Role of (KCs): The KCs played a crucial role in providing and verifying the required information on many of the parameters used for computing the Index (as detailed in Table 2.1). In addition, there were cases wherein though information was available online, there were major accessibility and comparability issues such as server time-outs or down-time, excessive time for document appearance/downloading, and user interface problems, among others, and the KCS had to be approached for providing clarity to help address these issues. (Chapter 8 provides an overview of the accessibility of the State/UT land portals).

2.4. Challenges and Issues Faced in the Sampling and Test Checks

During the course of sample selection and on-line test checks, the study team encountered a number of challenges pertaining to the extraction and compilation of the sampling framework, duplication of village records, data updation and discrepancy issues, problems related to incomplete/inaccessible data, and server issues. In addition to these, there were also problems with regard to identification of plots/*khasra* number ranges and drop-down lists for khasra/plot numbers during the process of identifying headquarter villages for the quality test checks (for details refer to the Annexures).

2.5. Limitations and Mitigation Measures Undertaken

a) Differences in data and organisation of data between the DoLR and the State/UT websites: There were cases of inconsistency between the aggregate data at the level of the districts/*tehsils* and the actual village-level information, as reported on the DoLR website. For example, it was reported that Suratgarh *tehsil* (in Ganganagar district Rajasthan) had digitised a total of 995 CMs but the village-level data showed only one village called 'Rangmahal' with all 995 digitised CMs!

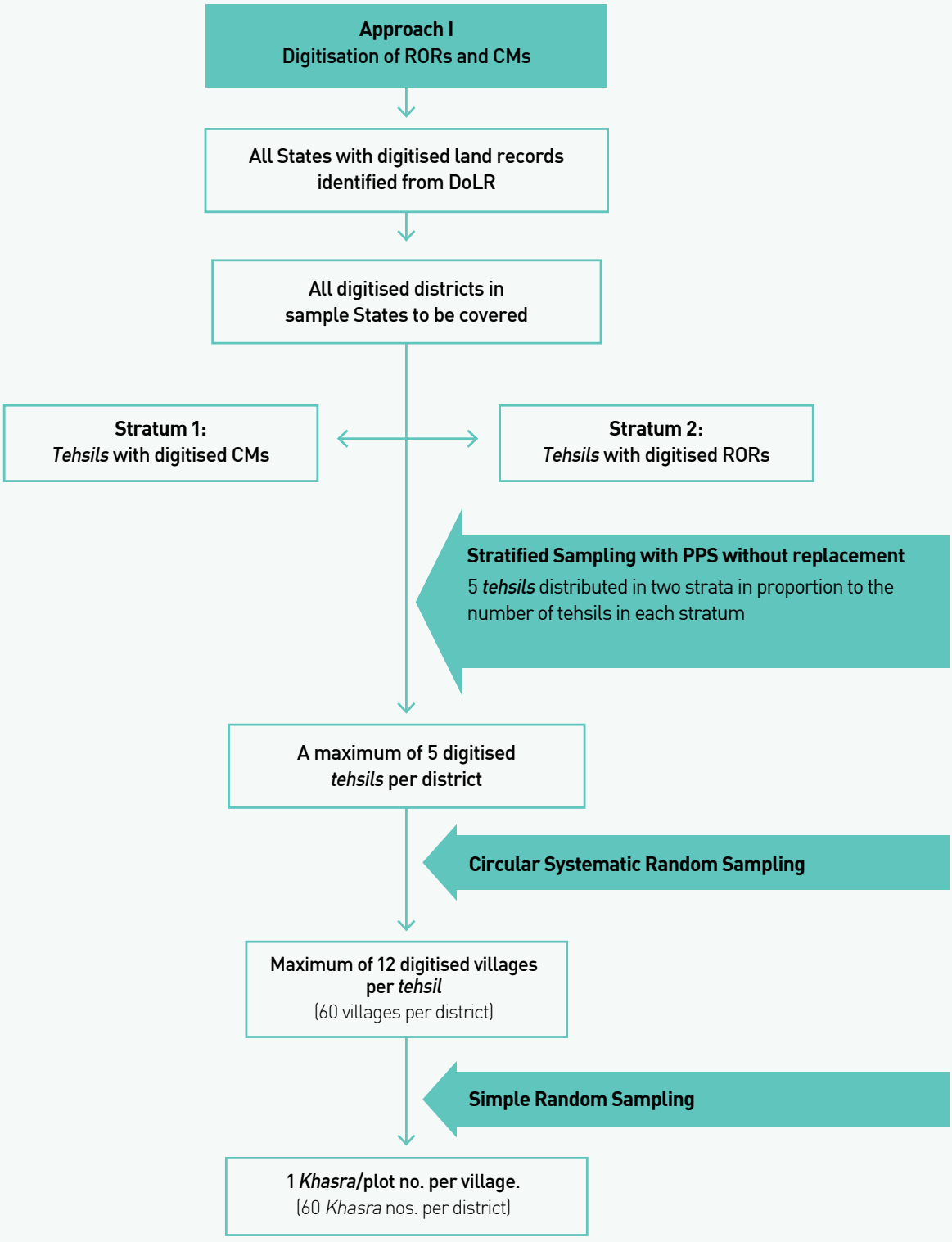
b) Updation of data in the State/UT and DoLR websites: In the case of a few States/UTs, inconsistency was also observed between the information available on the DoLR and the State/UT portals. For example, Lakshadweep and Delhi do not claim digitisation of CMs as per the DoLR but the portals for both these units show the availability of digitised CMs.

c) Difficulties in tracking transactions over time: Some examples of these difficulties are as follows:

- **Server speed:** This is especially true in the case of Gujarat, where slow server speed, website freezing, and errors in reporting occurred frequently.

The KCs played a crucial role in providing and verifying the required information on many of the parameters used for computing the Index

Box 2.1: Sampling Framework for the Extent of Digitisation of Land Records



Box 2.2: N-LRSI Index and World Bank Registering Property Index: Differences and Similarities

The World Bank "Registering Property" measure examines:

.. the steps, time and cost involved in registering property, assuming a standardized case of an entrepreneur who wants to purchase land and a building that is already registered and free of title dispute. In addition, the topic also measures the quality of the land administration system in each economy. The quality of land administration index has five dimensions: reliability of infrastructure, transparency of information, geographic coverage, land dispute resolution, and equal access to property rights.

Differences

In terms of the **Objectives,** the World Bank measure focuses only on registering property but takes a broader view in terms of assessing the details of the registration process (from start to finish), the elapsed time, and the costs incurred to complete each of the procedures. The N-LRSI focuses on the extent of digitisation of the registration process and how good is the access available to users.

On **Process,** the N-LRSI is divided into five steps that can be digitised whereas the Registering Property Index examines many more steps that are not necessarily amenable to digitisation. There is, however, one step which is amenable to digitisation that is not included in the N-LRSI, that is, the legacy registration record. The reason for excluding this step at this juncture in the N-LRSI was that it is still in its infancy in most Indian States/UTs (except for Maharashtra to an extent).

Similarities

Data Collection Procedure: The Registering Property Index takes the status as given on various parameters. The N-LRSI assesses the quality of access in many cases to be able to examine the quality of the service available.

Source: Doing Business 2020, World Bank, Oct 2019 https://www.doingbusiness.org/content/dam/doingBusiness/country/i/india/IND.pdf0 https://www.doingbusiness.org/en/methodology/registering-property accessed Dec 01, 2019

- Portals were not available in some States/UTs for dipstick test-checks.

- The language used in the States/UTs for various registers and matters that are part of land record management varies considerably across the States/UTs. Even the same term could have a different meaning in different States/UTs! The team thus had to prepare a listing of these terms and concepts based on the Acts and Rules, and information from the KCs (please see Annexures for listing of the terms).

(d) Measuring citizen/user satisfaction in the next round: The N-LRSI has been built by using key dimensions of the supply of land record services by each State/UT. While findings from Phase-I of the study focus on the supply side factors, in the second phase, NCAER proposes to expand the N-LRSI to include user perceptions of the access, quality, reliability, and utility of land record services. The N-LRSI will then more credibly capture both the demand and the supply-side dimensions of land record-related services in each State/UT, thereby spurring individual States/UTs to improve their respective standings in the N-LRSI rankings. (Refer to Box 2.2 for a comparative assessment between the N-LRSI and the World Bank Registering Property Index).

CHAPTER

3

EXTENT OF DIGITISATION OF TEXTUAL RECORDS

Textual records, commonly known as the Record of Rights (RoRs), are the core land records accorded the greatest weightage in deciding issues of ownership and area or extent of land in India. The RoR can also yield important information on matters like possession, use, and encumbrances affecting a property.

3.1. Area with Land Records

An important step before undertaking the verification of the extent of digitisation was to estimate the proportion of area in a State/UT for which the land records exist. The digitisation of this textual record presumes the existence of a written land record. This chapter begins with an estimation of the area with land records in the States/UTs in India. This is followed by a discussion on the achievements reported on the DoLR website and the State/UT websites, and the extent to which these have been borne out by the test checks carried out under this exercise.

Figure 3.1 summarises information about the availability of textual records by grouping States/UTs into the following three categories:

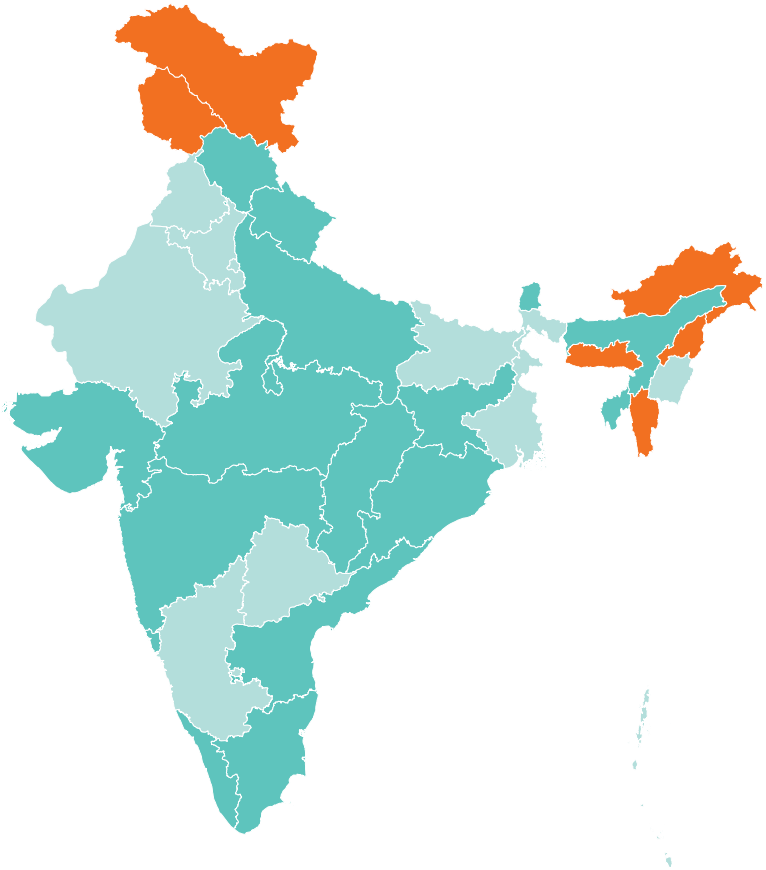
a) States/UTs with cadastral survey-based land records for their entire areas, except areas classified as forest lands.

b) States/UTs with land records for less than the total area (other than the area under forest lands); typically, these are States/UTs with some portion of rural or urban land without a cadastral survey-based land record.

c) States/UTs in which written land records or digitised records are not available for most of their area. Some of these States/UTs have community-based land tenure systems that are either not recorded or not yet digitised. They do, however, have records for some of their urban areas.

1 Whichever figure from the two sources is higher has been finally adopted for the analysis.

Figure 3.1: Area with Land Records



States/UTs with land records for their entire area (21)

- Andhra Pradesh
- Assam
- Chandigarh*
- Chhattisgarh
- Dadra & Nagar Haveli
- Daman & Diu
- Goa
- Gujarat
- Himachal Pradesh
- Jharkhand
- Kerala
- Lakshadweep
- Madhya Pradesh
- Maharashtra
- Odisha
- Puducherry
- Sikkim*
- Tamil Nadu
- Tripura
- Uttarakhand
- Uttar Pradesh

States/UTs lacking land records for some of their area, mostly urban (10)

- Andaman & Nicobar
- Bihar
- Haryana
- Karnataka
- Manipur
- NCT of Delhi
- Punjab
- Rajasthan
- Telangana (Hyderabad)
- West Bengal (Small portion of Kolkata)

States/UTs without appropriately written or digitized land records (6)

- Arunachal Pradesh
- Jammu & Kashmir
- Ladakh
- Mizoram
- Meghalaya
- Nagaland

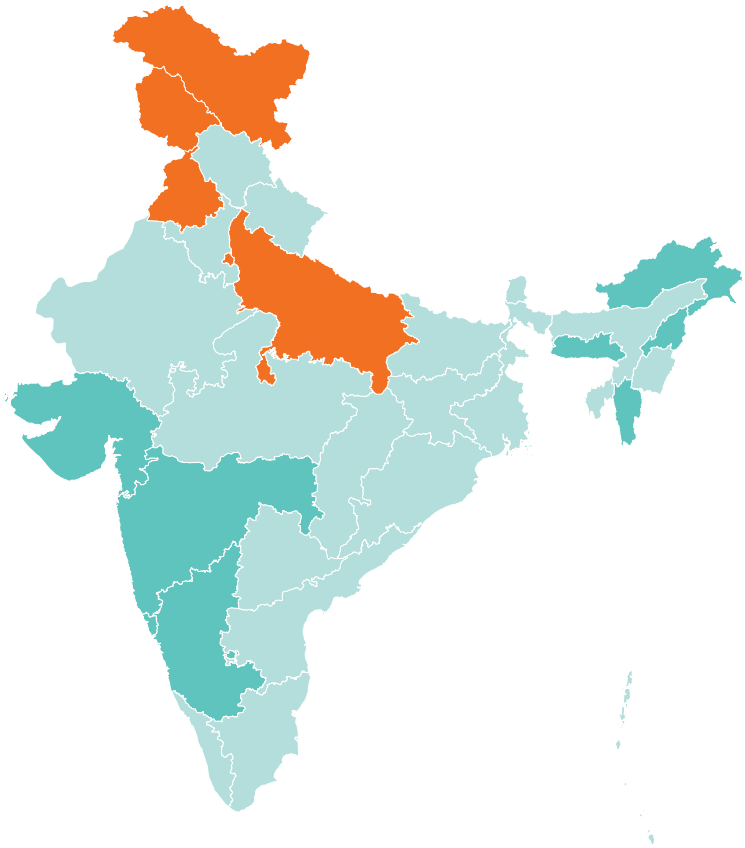
21 States/UTs have land records for their entire area

SOURCE: N-LRSI 2019-20, NCAER

Note: 1. Sikkim and Chandigarh have not placed their digitised record on the web. 2. Kerala reports an unusual situation. It both reports digitisation of textual record and possesses a web portal for the textual records. However, in practice, the information is still to be made available on the web.

Urban Land Records

The information gathered during this exercise brought out the fact that as regards urban areas where most property-related transactions take place, very few States/UTs have separate survey-based records that reflect the special characteristics of urban areas. Only 8 States/UTs have made some efforts in this direction, though even in these, the notion of creating a detailed record of built-up properties like multi-storeyed apartment blocks with segregated ownership, is still in its infancy. Most other States/UTs have either sketchy records of built-up property that generally characterise rural records or only a municipal property tax record without the backing of a survey. The States/UTs in these three categories are as follows:



SOURCE: N-LRSI 2019-20, NCAER

States/UTs with separate survey record/property cards (8)

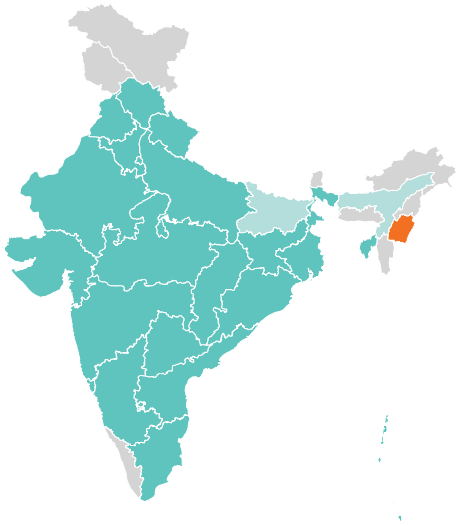
- Arunachal Pradesh (partial)
- Chandigarh (partial)
- Goa
- Gujarat
- Karnataka (partial)
- Maharashtra
- Meghalaya
- Mizoram (partial)
- Nagaland (partial)

States/UTs with urban records same as rural (23)

- Andaman & Nicobar Islands
- Andhra Pradesh
- Assam
- Bihar
- Chhattisgarh
- Dadra & Nagar Haveli
- Daman & Diu
- Haryana
- Himachal Pradesh
- Jharkhand
- Kerala
- Lakshadweep
- Madhya Pradesh
- Manipur
- Odisha
- Puducherry
- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttarakhand
- West Bengal

States/UTs with only Municipal property tax records (6)

- Delhi
- Jammu and Kashmir
- Karnataka (partial)
- Ladakh
- Punjab
- Uttar Pradesh



3.2. Textual Record of Digitisation as per the DoLR

The DoLR website, further substantiated with state-specific information obtained through KCs,1 shows that 31 States/UTs have digitised their textual records. Most of these 31 States/UTs report a high rate of digitisation of RoRs, in excess of 90 per cent. The States/UTs with a relatively lower level of digitisation are Manipur, Assam, and Bihar. The country-wide position is presented in Figure 3.2.

3.3. Test-Check Results

The all-India (31 States/UTs) test-check results showed a 92 per cent success rate for the villages stated to have digitised RORs, according to the DoLR website (as accessed in September 2019) or as reported by State/UT sources. The leading States/UTs are Dadra and Nagar Haveli, Odisha, Chhattisgarh, Goa, and Andhra Pradesh. These results are quite consistent with the extent reported on the DoLR website or by the KCs (Figure 3.3). States like Haryana, Jharkhand, Karnataka, Himachal Pradesh, and Telangana had relatively lower success rates in the test checks as compared to the information reported on the DoLR website (details are provided in Annexure Table A3.2).

Figure 3.2: Digitisation of Record of Rights (RoRs)

0%-50% 50%-90% 90%-100%

State	Percentage of villages with digitised RORs (DoLR)
Chhattisgarh	100.00
Dadra & Nagar Haveli	100.00
Himachal Pradesh	100.00
Lakshadweep	100.00
Madhya Pradesh	100.00
Maharashtra	100.00
Odisha	100.00
Puducherry	100.00
Tamil Nadu	99.90
Tripura	99.89
Karnataka	99.63
Telangana	99.44
Jharkhand	99.09
Andaman & Nicobar	98.10
West Bengal	98.10
Andhra Pradesh	97.16
Goa	96.97
Rajasthan	96.80
Gujarat	96.41
Uttar Pradesh	96.24
Delhi	94.69
Uttarakhand	94.37
Punjab	93.62
Haryana	92.86
Daman & Diu	78.57
Bihar	65.31
Assam	58.26
Manipur	15.58

Source: DoLR website/State/UT Sources

Figure 3.3: RoR Digitisation Comparison between DoLR Website/ information obtained from States/UTs, and the Test-Check Results

Source: DoLR website/State/UT Sources and N-LRSI 2019-20, NCAER

3.4. Reasons for Failure in the RoR Test-Checks

The failure of reported digitisation by States/UTs during the test-checks can be broadly attributed to the following three reasons:

1. Administrative Unit Not Available

This relates to cases where the number of the village or survey/plot (and sometimes even of the tehsil) was not available on the portal.

2. RoR Not Accessible

This relates to cases where even after all the necessary details had been provided to access the RoR, the actual RoR did not appear on the screen.

Figure 3.4: Reasons for Failure in RoR Test Checks (Percentage of Sampled Plots)

0 | 1-50 | 51-75 | 76-100

	District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Plot no./ khasra no. not available in dropdown	RoR does not appear	Server Issue	Others
Andaman & Nicobar	0	100.00	0	0	0	0	0
Andhra Pradesh	0	0	51.61	48.39	0	0	0
Assam	22.94	44.04	25.69	0	0	0	7.34
Bihar	0	19.54	40.39	40.07	0	0	0
Chhattisgarh	0	38.71	61.29	0	0	0	0
Goa	0	0	100.00	0	0	0	0
Gujarat	0	0	92.19	7.81	0	0	0
Haryana	0	0	29.73	0	0	66.8	3.47
Himachal Pradesh	0	0	100.00	0	0	0	0
Jharkhand	0	2.82	10.56	32.63	53.99	0	0
Karnataka	0	0	76.98	23.02	0	0	0
Lakshadweep	0	0	0	100.00	0	0	0
Madhya Pradesh	0	0	100.00	0	0	0	0
Maharashtra	0	0	78.21	21.79	0	0	0
Manipur	0	44.44	48.15	0	0	0	7.41
NCT of Delhi	0	0	80.00	20.00	0	0	0
Odisha	0	0	100.00	0	0	0	0
Puducherry	0	0	100.00	0	0	0	0
Punjab	0	0	100.00	0	0	0	0
Rajasthan	0	0	17.57	0	13.51	0	68.92
Tamil Nadu	0	0	16.41	83.59	0	0	0
Telangana	0	19.05	66.67	9.21	1.27	0	3.81
Tripura	0	5.13	87.18	0	7.69	0	0
Uttar Pradesh	0	0	34.33	0	0	0	65.67
Uttarakhand	0	0	78.57	21.43	0	0	0
West Bengal	0	0	90.91	9.09	0	0	0

Source: N-LRSI 2019-20, NCAER

3. Server Failures

This relates to cases where even after repeated attempts at different time periods, the server remained unresponsive and/or errors were constantly reported on-screen. A comparison of the reasons for the failures in the test-checks across the States/UTs shows that the non-availability of the sample villages in the State/UT portals was the pre-dominant reason (Figure 3.4).

For details, please refer to details presented in Annexure Table A3.3.

3.5. Legal Usability of Textual Records

The request for obtaining copies of the RoRs is amongst the frequently-used services from the digitised records. Easy access to legally usable copies of the RoRs is useful for a variety of purposes in relation to the land, including for ascertaining collateral details, legal disputes, availing of services and benefits from the government, and establishing domicile status, among others. Hence, digitisation and the availability of legally usable RoRs offer citizens a number of benefits. States/UTs offering digitally-signed legally usable copies through web portals are clearly ahead of States that only offer these through a network of designated Citizen Service Centres (e-seva or CSCs). However, the service offered by the CSCs or e-service centres is clearly superior to cases wherein the access is provided only from government offices.

Data on the availability of legally-usable copies was collected through the KCs. The States/UTs have been grouped into three broad categories as follows (Figure 3.5):
1) States/UTs providing legally usable copies from the websites;
2) States/UTs providing legally usable copies from CSCs; and 3) States/UTs providing legally usable copies from the relevant department office.

Figure 3.5: Availability of Legally Usable Copies of RoRs

Digitally signed from their website

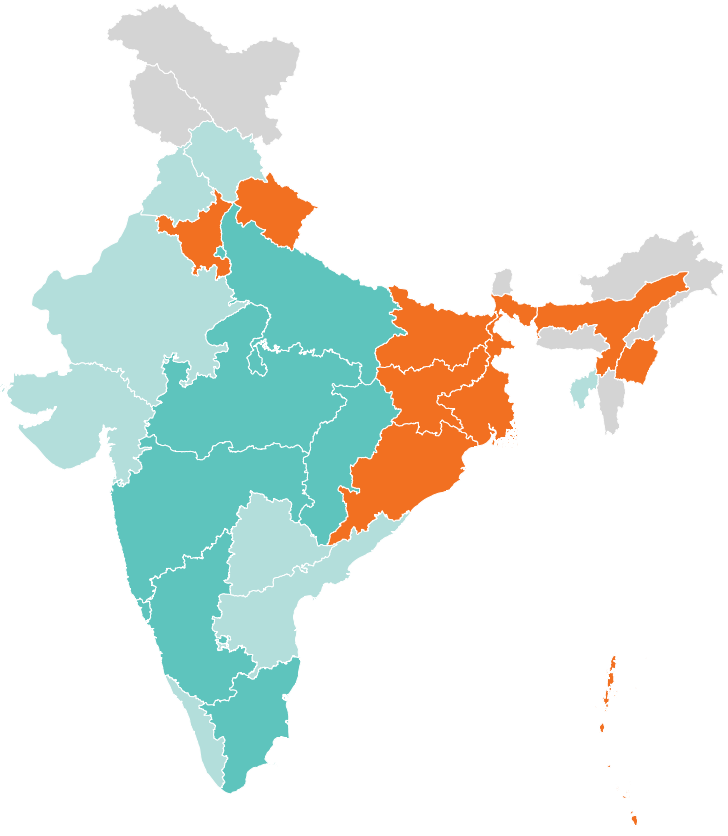
- Chhattisgarh
- Dadra & Nagar Haveli
- Delhi
- Goa
- Karnataka
- Madhya Pradesh
- Maharashtra
- Tamil Nadu
- Uttar Pradesh

Only from Citizen Service Centres

- Andhra Pradesh
- Daman & Diu
- Gujarat
- Himachal Pradesh
- Kerala
- Puducherry
- Punjab
- Rajasthan
- Telangana
- Tripura

Only from relevant department

- Andaman & Nicobar
- Assam
- Bihar
- Haryana
- Jharkhand
- Lakshadweep
- Manipur
- Odisha
- Uttarakhand
- West Bengal



Source: N-LRSI 2019-20, NCAER

CHAPTER

4

EXTENT OF DIGITISATION OF SPATIAL RECORD

The Cadastral Map (CM) is a survey-based representation of the boundaries and extent of individual plots of land. The achievement that States/UTs have reported on the DoLR website or as obtained from the States/UTs with regard to spatial record digitisation, was test-checked through an exercise devised for the sample villages. (The sampling strategy for the test checks has been discussed in detail in Chapter 2 of the report and the sample size is provided in Annexures A2.3 and A2.4.)

Out of the 28 States/UTs that made digitised textual records available for the entire area or some area of the State/UT on the web, digitised CMs were available for 13 States/UTs. In addition, Kerala had CMs on the web that were test-checked. In the case of the remaining 15 States/UTs, the respective positions were as follows:

1. States/UTs with no (zero per cent) authenticated digitised CMs (4): This situation was witnessed in the States/UTs of Daman and Diu, Delhi, Karnataka, and Haryana. Haryana had digitised CMs under a portal belonging to an agency other than the Revenue Department, and since the State's Revenue Department has not accorded legitimacy to these CMs, Haryana has also been included in this category.

2. States/UTs that report digitised CMs but the relevant portals could either not be located or were not amenable to a plot-wise test-check (9): This situation was seen in the States/UTs of Andaman and Nicobar Islands, Dadra and Nagar Haveli, Goa, Gujarat, Manipur, Puducherry, Tripura, Punjab, and Uttarakhand.

3. Accessibility issues in portals (2): The States of Assam and Bihar had web portals for CMs. However, these could not be accessed due to repeated server failure and incomplete information being provided on these portals.

4.1. Extent of CM Digitisation as per the DoLR

The DoLR website (accessed in September 2019) and the KCs' report showed that 26 States/UTs had digitised CMs, covering some 50 per cent of their villages. Some States/UTs reported 100 per cent digitised CMs (Odisha, Chhattisgarh, and Madhya Pradesh) whereas others recorded a very low level of digitisation (Manipur, Rajasthan, Kerala and Andhra Pradesh), with the average digitisation being 6 per cent (Figure 4.1).

4.2. CM Test-Check Results

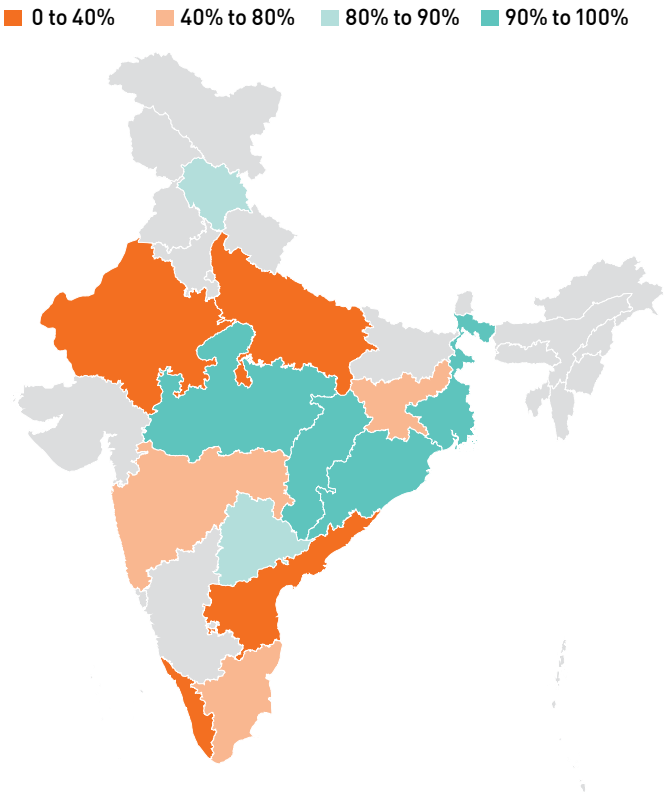
The extent of digitisation reported on the DoLR website or by the State/UT sources has been compared with the test-check results in Figure 4.2.

Overall, the test-checks revealed that the achievement claimed on CM digitisation was less than that for RoRs. The concerned figure in the case of the RoRs was 91.8 per cent (the average for 28 States), while the corresponding figure for the CMs was only 63.9 per cent (the average for 14 states). Only States like Odisha (with a claim of 100 per cent digitisation) and Andhra Pradesh (with a claim of merely

2 Kerala was a unique case in the CM test-checks, as its portal provides a preview copy and further requests for payment of Rs 750 for the copy. The 'preview only' copy was considered sufficient to indicate availability during the test-checks.

3 The higher of the two sources has been adopted for this analysis.

Figure 4.1: Extent of CM Digitisation



States	Percentage of villages with digitised CMs (DoLR)
Chhattisgarh	100.0
Lakshadweep	100.0
Madhya Pradesh	100.0
Odisha	100.0
West Bengal	92.3
Himachal Pradesh	88.2
Telangana	80.6
Maharashtra	76.9
Jharkhand	76.8
Tamil Nadu	50.3
Uttar Pradesh	11.8
Rajasthan	9.3
Kerala	7.0
Andhra Pradesh	1.3

Source: DOLR website/State/UT Sources

1.3 per cent) showed a near perfect to perfect score during the test-checks. No other state crossed the figure of 90 per cent while Himachal Pradesh scored an abysmal 36.3 per cent. (Detail- are provided in Annexure Table A4.1).

4.3. Reasons for Failure in the CM Test-Checks

The failure during test-checks of reported digitisation by the States/UTs to match the claimed achievement can be broadly attributed to the following three reasons (Figure 4.3)

1. Administrative Unit Not Available

This relates to cases where the number of the village or survey/plot (and sometimes even of the tehsil) was not available on the portal.

2. CM Not Accessible

This relates to cases where even after all the necessary details for accessing the CM were provided, the actual CM still did not appear on the screen.

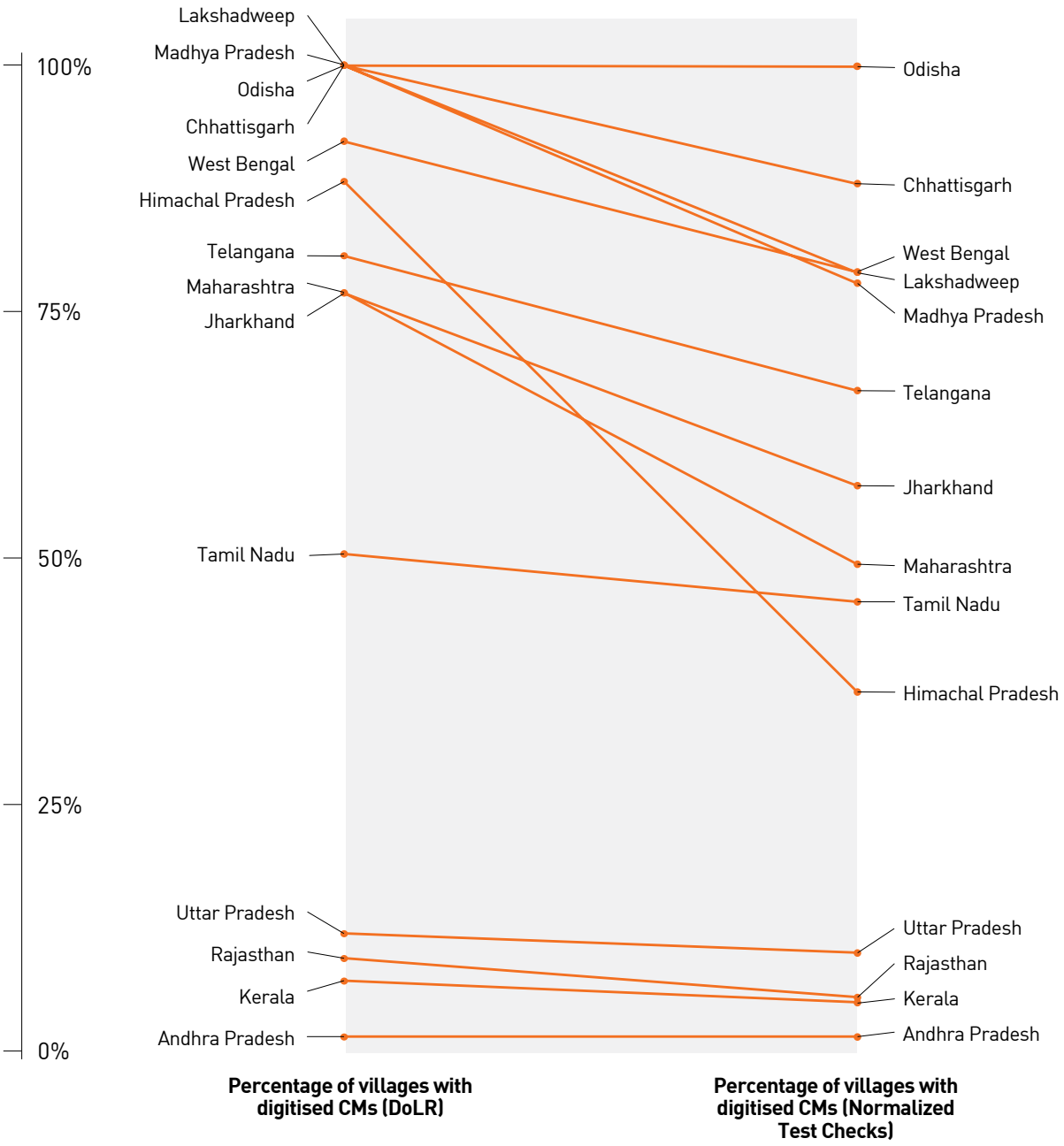
3. Server Failure

This relates to cases where even after repeated attempts at different time periods, the server remained unresponsive and/or errors were constantly reported on-screen.

A comparison of the reasons for the failures in the test-checks across the States/UTs, shows that the non-availability of the sample villages in the State/UT portals was the pre-dominant reason.

Please refer to Annexure Table A4.2 for details.

Figure 4.2: CM Digitization: Comparison between DoLR & N-LRSI Test Checks



Source: DOLR website/State/UT Sources and N-LRSI 2019-20, NCAER

Figure 4.3. Reasons for Failure in CM Test-Checks

0 | 1 to 50 | 51 to 75 | 76 to 100

	District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Plot no. not available in dropdown	CM does not appear	Server Issue	Others
Chhattisgarh	0	14.91	33.54	0	51.55	0	0
Himachal Pradesh	12.87	9.65	63.81	0	0	12.60	1.07
Jharkhand	0	10.82	57.31	31.87	0	0	0
Kerala	0	6.06	45.45	0	48.48	0	0
Lakshadweep	0	0	100.00	0	0	0	0
Madhya Pradesh	0	0	55.21	44.79	0	0	0
Maharashtra	0	28.24	41.18	6.27	0	0	24.31
Odisha	0	0	100.00	0	0	0	0
Rajasthan	0	90.00	0.83	0	9.17	0	0
Tamil Nadu	0	0	13.42	8.05	78.52	0	0
Telangana	0	7.52	74.61	5.33	3.45	6.90	2.19
Uttar Pradesh	0	5.13	91.45	0	0	0	3.42
West Bengal	0	0	0	0	100.00	0	0

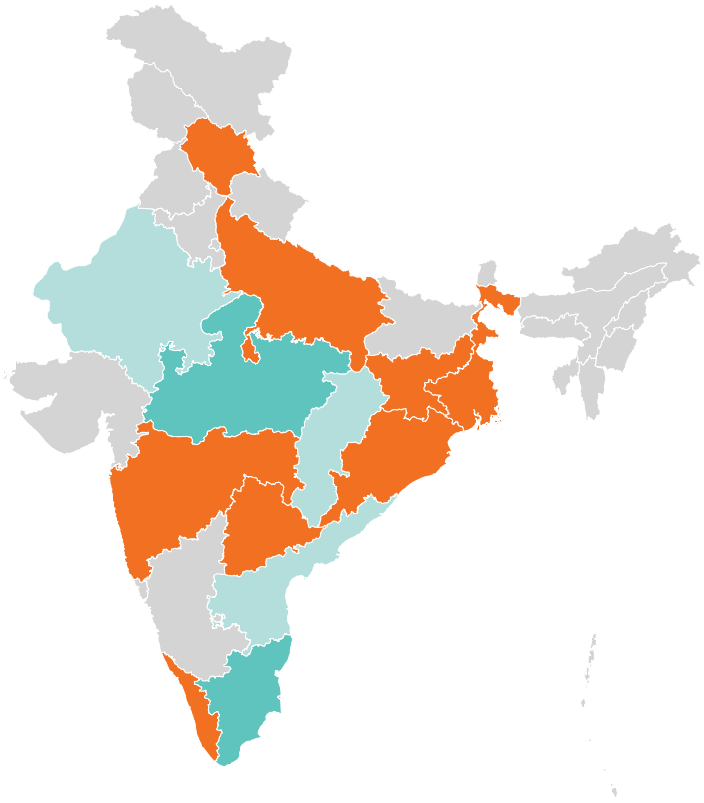
Source: N-LRSI 2019-20, NCAER

Non-availability of the sample villages in the State/ UT portals was the pre-dominant reason for failure during CM test checks

4.4. Legal Usability of Spatial Records

As in the case of the textual records discussed in Chapter 3, the data on this parameter was gathered through the KCs. Based on the information received, the States/UTs were placed into the following three categories: those providing legally usable copies from the websites; those providing legally usable copies from CSCs; and those providing legally usable copies from the relevant department office (depicted in Figure 4.4).

Figure 4.4: Availability of Legally Usable Copies of CMs



Digitally signed from their website
- Lakshadweep
- Madhya Pradesh
- Tamil Nadu

Only from Citizen Service Centres
- Andhra Pradesh
- Chhattisgarh
- Rajasthan

Only From relevant department
- Himachal Pradesh
- Jharkhand
- Kerala
- Maharashtra
- Odisha
- Telangana
- Uttar Pradesh
- West Bengal

Source: N-LRSI 2019-20, NCAER

CHAPTER

5

DIGITISATION OF THE REGISTRATION PROCESS

Registering a transaction in relation to property and obtaining a copy of the registered document was once an extremely cumbersome and time-consuming process in India. Over time, the use of technology and improvements in procedures have, however, led to considerable progress in reducing the time taken and the discretion available to various officials involved in the registration process. Even so, the possibilities offered by contemporary technology for eliminating the need for the physical presence of parties before a registration authority, are yet to be fully harnessed. Maharashtra has made considerable headway in this direction and set an example for other States/UTs to follow. Most of the other States/UTs are at various stages of digitising the registration process. This study attempted to assess the progress made by States/UTs in offering better service in this regard. The digitisation of the actual process of registration comprises the following five stages:

1) Entry of referent data related to the transaction to be registered;

2) Availability of the circle rate that is used to calculate the stamp duty/registration fee payable;

3) Payment of the stamp duty/registration fee;

4) Attestation of the document to be registered, by the competent authority (the Sub-Registrar); and

5) Delivery of the registered document to the concerned parties.

The progress made by States/UTs on the extent of computerisation of the above stages has been gleaned through an assessment of the KCs and a detailed search on the respective websites. The DoLR on its part, seeks reports from States/UTs in a generic way on computerisation of registration and specifically on two of these five stages, viz., the online availability of circle rates and stamp duty payment. As regards the reference to the two stages on which DoLR seeks specific reports from the States/UTs, it has been found that 82 per cent of the SROs in 37 States/UTs make circle rates available online while 53 per cent in 37 States/UTs have online payment facilities.

In order to compare the achievement reported on the DoLR website with the status borne out by this exercise, at the basic level, computerisation of registration may be considered as referring to any one of the five stages mentioned above. Using this benchmark, 15 States/UTs were found to have a web portal for public data entry; 19 States/UTs had an e-stamping facility for stamp duty payment, though only 9 States/UTs had an online payment provision; 8 States/UTs allowed for the document being registered to be attested through digital signatures; and 11 States/UTs offered the option of delivering the registered document as a soft copy.

The stage-wise details of the achievements on digitization of the various stages of the registration process are discussed below.

Maharashtra has made considerable headway in the direction of digitization of registration process and set an example for other States/UTs to follow

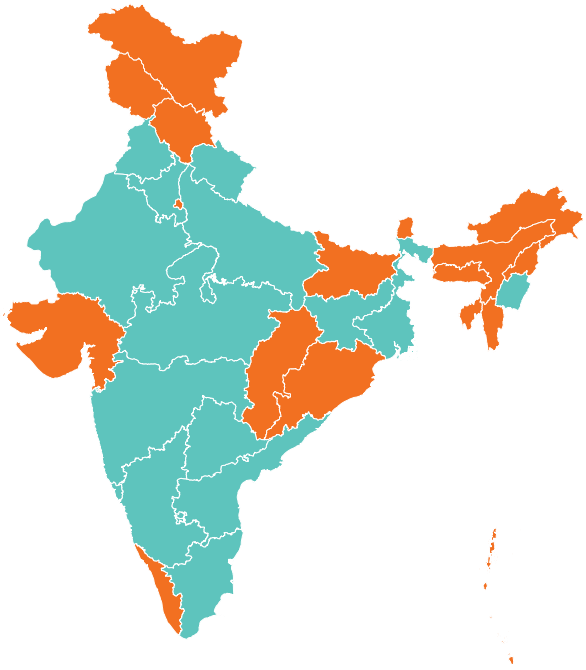
15 States/ UTs have a provision for on-line Public Data Entry

5.1. Public Data Entry

Public data entry implies a facility on a web portal for filling the requisite details for registration of a transaction. The availability of a State/UT web portal for this purpose in the public domain formed the basis of assessment of digitisation of this stage of registration. A search for the possible portals showed that 15 States/UTs offered this facility to the public (Figure 5.1).

5.2. Circle Rate Availability

The circle rate is the minimum price per unit of land used for calculating the stamp duty and the registration fee when the transaction for transfer of a property needs to be registered. Once the basic data has been entered, the stamp duty and registration fee must be calculated and paid. Digitisation of this registration step implies that the updated rates are available online for all areas to facilitate immediate calculation of the stamp duty and registration fee to be paid on registration.



Source: N-LRSI 2019-20, NCAER

Figure 5.1: States/UTs with Web Portal for Public Data Entry

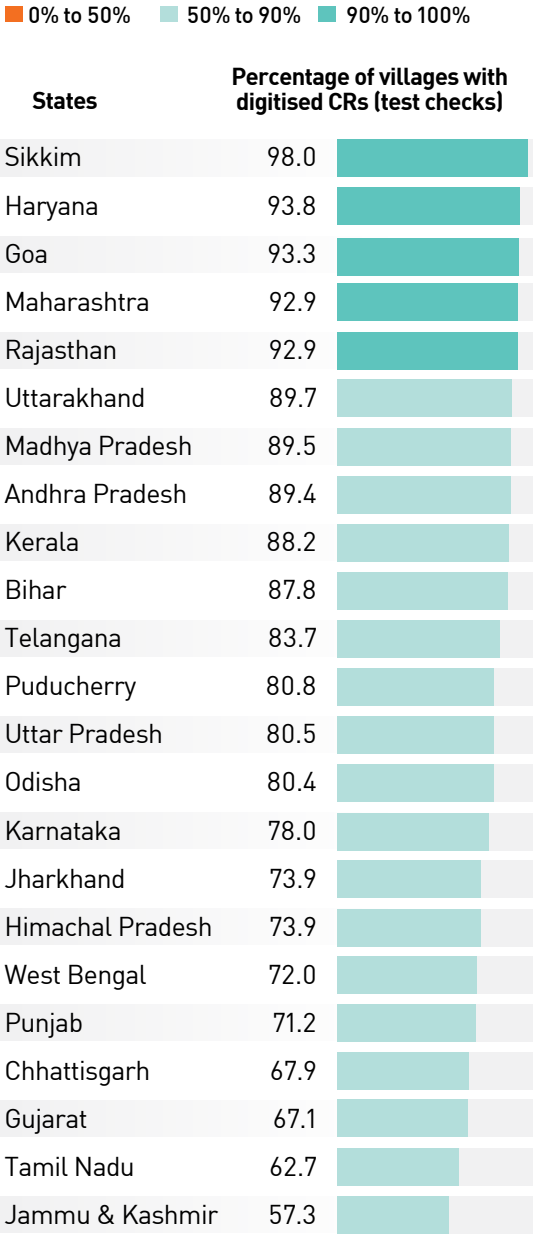
States/UTs with an online portal for Public Data Entry: 15
Andhra Pradesh
Goa
Haryana
Jharkhand
Karnataka
Madhya Pradesh
Maharashtra
Manipur
Punjab
Rajasthan
Tamil Nadu
Telangana
Uttar Pradesh
Uttarakhand
West Bengal

States/UTs without an online portal for Public Data Entry: 22
Andaman & Nicobar
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Dadra & Nagar Haveli
Daman & Diu
Delhi
Gujarat
Himachal Pradesh
Jammu and Kashmir
Kerala
Ladakh
Lakshadweep
Meghalaya
Mizoram
Nagaland
Odisha
Puducherry
Sikkim
Tripura

The assessment of the online availability of circle rates was carried out through test-checks for the sample villages selected to check the extent of land records digitisation. This assessment revealed that many States and UTs do not make circle rates available online on their websites. While 23 States/UTs have this facility, the format of online availability varies significantly across States/UTs. Some States like Andhra Pradesh, Bihar, Gujarat, and Jharkhand, have a portal that simply asks for basic administrative units like the district, tehsil, and village to calculate the stamp duty. Other States like Himachal Pradesh, Punjab, Haryana, Chhattisgarh, and Uttarakhand list the State-/district-/tehsil-wise files, which makes the search more tedious. In the case of West Bengal, while the circle rates can be retrieved through the portal, the State/UT also requires details like the plot number, proposed land use, distance from the road and so on, to be filled at the initial stages. Kerala had a similar requirement for entry of the re-survey number, sub-division, and land type. In the case of a few States/UTs, their rates were available on the respective State/UT and district websites. The format in which the circle rates are available online makes a huge difference in the search, with certain formats making the search easy, while the others make it cumbersome. Clearly there is scope for States/UTs to become more user-friendly in this regard.

Figure 5.2 presents a comparative picture of the extent of online availability of circle rates across States/UTs. In providing access to circle rates, the States/UTs exhibited a failure rate ranging from 2 per cent to 42.7 per cent. Sikkim, Haryana, Goa, Maharashtra, and Rajasthan were among the best-performing States/UTs. The failure was mostly attributable to the fact that village names from the land records were not available in the database of circle rates (details presented in Figure

Figure 5.2: Success Rates for Accessing on-line availability of Circle Rates



Source: N-LRSI 2019-20, NCAER

5.3). The details of the reasons are provided in Annexure Table A5.1.

5.3. Stamp Duty Payment

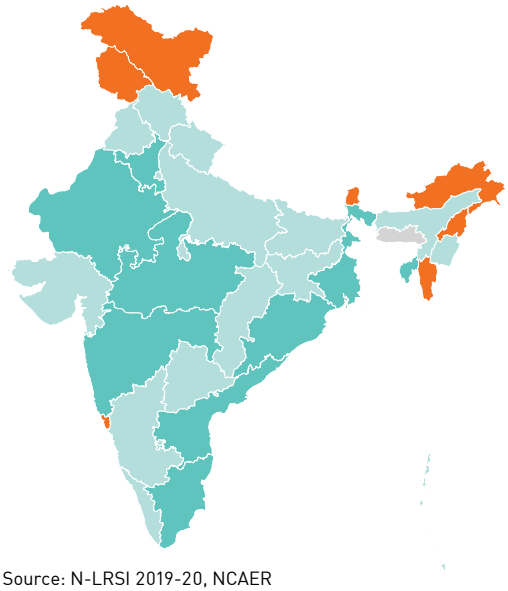
Once the stamp duty and registration fee have been calculated, these need to be paid in advance of presenting the transfer document for registration. In the traditional system, the payment involves the purchase of paper stamps from stamp vendors or government treasuries. For many years now, an improvement carried out in most States/UTs (19) has been the adoption of a system for making e-stamps available. These can be purchased by making the payment at branches of designated banks/agencies. An even more user-friendly facility now available in nine States/UTs is the ability to pay directly

Figure 5.3: Reasons for Failure in Test-checks for on-line Availability of Circle Rates (percentage of sampled villages)

0 | 1 to 50 | 51 to 75 | 76 to 100

	District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Survey no./Plot no./ khasra no. not available in dropdown	CR does not appear	Server Issue	Others
Gujarat	0	6.34	2.29	4.23	14.79	0	72.36
Punjab	0	0	59.93	0	0	0	40.07
Tamil Nadu	0	0	0	0	76.67	23.33	0
Uttarakhand	0	0	69.62	0	30.38	0	0
West Bengal	0	6.13	67.41	0	26.46	0	0
Telangana	0	11.39	62.66	0	23.10	0	0
Karnataka	18.07	0	66.87	0	15.06	0	0
Bihar	0	12.95	82.01	0	5.04	0	0
Rajasthan	0	0	96.88	0	3.13	0	0
Goa	0	0	100.00	0	0	0	0
Andhra Pradesh	0	0	100.00	0	0	0	0
Haryana	0	0	100.00	0	0	0	0
Jammu & Kashmir	0	0	100.00	0	0	0	0
Madhya Pradesh	0	0	100.00	0	0	0	0
Maharashtra	0	0	100.00	0	0	0	0
Puducherry	0	0	100.00	0	0	0	0
Sikkim	0	0	100.00	0	0	0	0
Himachal Pradesh	0	0	87.95	0	0	0	0
Odisha	0	0	40.41	0	0	0	0
Jharkhand	68.09	6.38	25.53	0	0	0	0
Kerala	0	80.00	20.00	0	0	0	0
Uttar Pradesh	19.86	49.59	18.08	0	0	0	0
Chhattisgarh	0	98.26	1.74	0	0	0	0

Source: N-LRSI 2019-20, NCAER



Source: N-LRSI 2019-20, NCAER

Figure 5.4: Systems for online Stamp Duty Payment

States/UTs with online payment provision
Andhra Pradesh
Haryana
Madhya Pradesh
Maharashtra
Odisha
Rajasthan
Tamil Nadu
Tripura
West Bengal

States/UTs with e-stamping facility
Andaman & Nicobar
Assam
Bihar
Chandigarh
Chhattisgarh
Dadra and Nagar Haveli
Daman and Diu
Delhi
Gujarat
Himachal Pradesh
Jharkhand
Karnataka
Kerala
Manipur
Puducherry
Punjab
Telangana
Uttar Pradesh
Uttarakhand

States/UTs using paper stamps
Arunachal Pradesh
Goa
Jammu and Kashmir
Ladakh
Lakshadweep
Mizoram
Nagaland
Sikkim

online and also have the SRO verify this payment online.

Figure 5.4 presents the distribution of States/UTs across the different modes of stamp duty payment.

5.4. Attestation of the Registered Document

Once it has been verified that the data relevant to the transaction has been correctly entered in the document to be registered, the stamp duty and registration fee have been calculated accurately and their payment verified, the SRO attests the document for the transaction after ascertaining the identity of the parties along with witnesses. If this process is undertaken digitally, it signifies another step in the direction of reducing the time taken in the process and the discretion exercised by the SRO in the registration process. Based on the information received from KCs in this regard, the States/UTs that have the facility of attestation of

8 States/ UTs have the provision for on-line attestation of registered document, while 11 have the facility for on-line delivery of the registered document

Table 5.1: States/UTs with Facility of Online Attestation of the Registered Document

Bihar
Karnataka
Madhya Pradesh
Maharashtra
Manipur
Odisha
Uttarakhand
West Bengal

Table 5.2: States/ UTs with Facility of Online Delivery of the Registered Document

Andhra Pradesh
Chandigarh
Madhya Pradesh
Maharashtra
Manipur
Odisha
Punjab
Tamil Nadu
Uttarakhand
Uttar Pradesh
West Bengal

the registered document through digital signatures have been listed in Table 5.1. Only 8 States/UTs provide the option of this facility to the SRO.

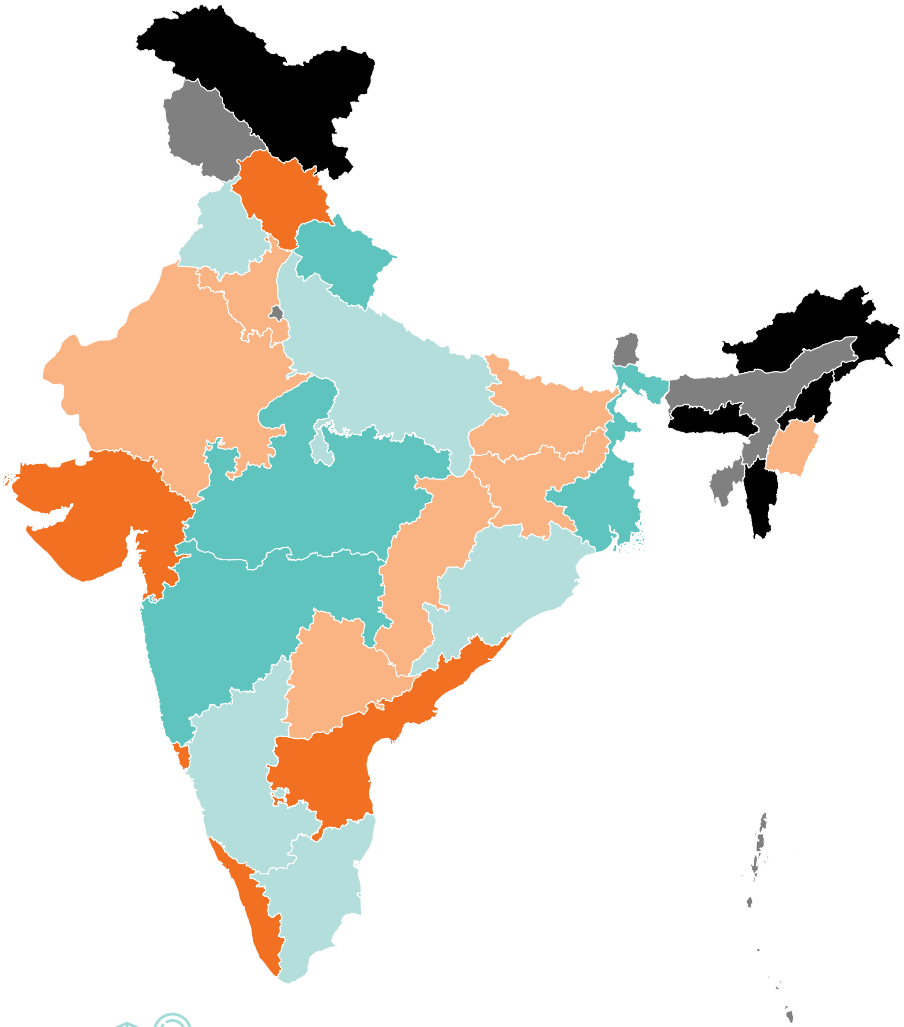
5.5. Online Delivery of the Registered Document

The last step in the registration process is the delivery of the registered document to the concerned parties. An online provision for attestation with a digital signature can definitely enable the concerned parties to receive a digital/soft copy of the document immediately on registration. This would ensure that no time is wasted in the process and that there is no delay in this delivery. Information was obtained from the KCs regarding availability of a facility to immediately deliver digital/soft copy of the registered document. The States/ UTs that have this facility are listed in Table 5.2.

5.6. Summary of the Digitisation of the Registration Process

Based on the detailed discussion in this chapter, Figure 5.5 delineates the overall status of digitisation of various stages of the registration process (for details, please refer to Annexure Table A5.2). States/UTs have been placed into six groups—States/ UTs with digitisation of all the five stages of registration, followed by the States/ UTs with digital availability of four stages, followed by those with three, two, and one digitised step each, and finally those with no digitisation of registration.

Figure 5.5: Summary of Digitisation of the Registration Process



All stages
- Madhya Pradesh
- Maharashtra
- Uttarakhand
- West Bengal

4 stages
- Karnataka
- Odisha
- Punjab
- Tamil Nadu
- Uttar Pradesh

3 stages
- Bihar
- Chhattisgarh
- Haryana
- Jharkhand
- Manipur
- Rajasthan
- Telangana

2 stages
- Andhra Pradesh
- Chandigarh
- Goa
- Gujarat
- Himachal Pradesh
- Kerala

1 stage
- Andaman & Nicobar
- Assam
- Dadra and Nagar Haveli
- Daman and Diu
- Delhi
- Jammu and Kashmir
- Puducherry
- Sikkim
- Tripura

0 stages
- Arunachal Pradesh
- Ladakh
- Lakshadweep
- Meghalaya
- Mizoram
- Nagaland

4 States have all five stages of registration computerised

Source: N-LRSI 2019-20, NCAER

CHAPTER

6

QUALITY OF LAND RECORDS

Digitisation of existing land records is obviously not the creation of a substantially improved record by itself. It can facilitate the tallying of figures of the area of plots with total ownership in an account as well as of the total of all accounts with the area in a village, and so on. More important, it can enable analysis to highlight various shortcomings in the record that need correction for making the record more comprehensive and in line with reality. Finally, it can enable integration of various databases to further this process. In this context, the assessment to measure the quality of the digitised land records—either textual or spatial—was carried out with respect to the following five elements that ought to be captured in a comprehensive record:

1) Updating ownership details;

2) Extent of joint ownership;

3) Land use;

4) Land area; and

5) Recording encumbrances.

As discussed in Chapter 2, instead of a direct investigation of the on-ground situation, in this study, certain indicators have been devised to measure the quality of the digitised land record for each of the specified five elements.

6.1. Updating Ownership

The indicator being used to ensure accurate updating of ownership details in the record is the swiftness with which the mutation process occurs to reflect the change in ownership, following the registration of a transaction. In this context, the DoLR website provides information on the extent of "integration" between land records and registration, as well as prevalence of the practice of "instant mutation" in States/UTs. However, the exact nature of this *integration* and the understanding of *instant mutation* have not been clearly defined. For further clarity in this matter, it was felt that these terms can be understood to mean one or more of the following steps that represented a successively higher form of integration/instant mutation:

a) SROs can check the RoR online during the registration process.

b) Information about the registration is sent by the SMS/e-mail to the revenue office responsible for entering or attesting the mutation.

c) On registration, a note is generated and entered in the RoR automatically.

d) The mutation is attested on the same day as the registration.

In 7 States/UTs, automatic note in the RoR is generated with an instance of registration

Figure 6.1: States/UTs with Different Categories of "Integration" and "Instant Mutation"

Integration: Registration and Land Records	Number of States
States with no linkage between RoR and registration	14
States where SROs can only view RoRs online	5
States where SROs send SMS/e-mail to revenue office	11
States where an automatic note is generated in the RoR	7
States with mutation attested on the same day	0
Total	37

Source: N-LRSI 2019-20, NCAER

Information received from KCs has been used to categorise States/UTs in terms of the actual practice of what is meant by integration/instant mutation, as summarised in Figure 6.1.

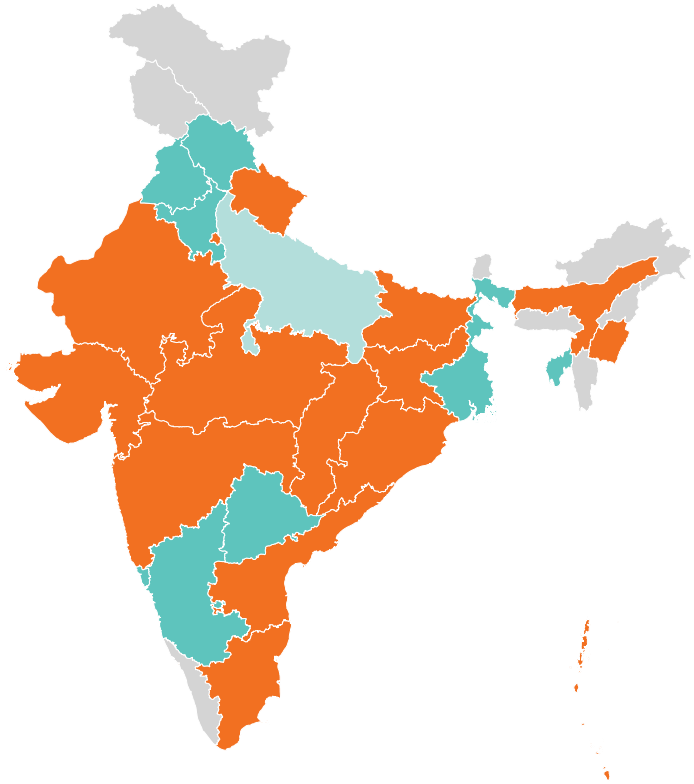
In 5 States/UTs, SROs can only check the RoR online while carrying out the registration; in another 11 States/UTs, information is sent by SMS/e-mail to the revenue office responsible for entering the mutation, along with the first step; while in the remaining 7 States/UTs, a note appears in the RoR automatically upon registration, in addition to the first two steps. A provision of same-day mutation is not yet available in any of the States/UTs. In 14 of the States/UTs reporting the digitisation of land records, there was no digital linkage between the revenue and registration department. For details, please see Annexure Table A6.1.

6.2. Extent of Joint Ownership

The extent of joint ownership in the record has been considered as the closest proxy for examining the status of possession as most States/UTs do not even have a separate column of possession to record this information. Even in the States/UTs that record this information separately in the RoR, there is no way of knowing if this is an accurate reflection of the on-ground situation since it often records that all owners are in possession. This study has adopted the proxy "number of owners in RoR" as a measure of likely possession. The assumption (based on the study referred to in Chapter 2) is that the greater the number of owners, the less likely it is that all are in possession. Regardless of the extent to which joint ownership reflects possession, the greater the number of owners, the greater is the difficulty in transacting in property. The position of States/UTs on how possession is recorded is presented in Figure 6.2.

The test-checks to gauge the extent of joint ownership revealed a number of States/UTs where the RoR accounts are kept for single owners. However, the plots listed in these individual accounts are often owned jointly with other individual account holders. In these cases, the plot-wise record of the co-sharers (where available) was referred to and not the RoR per se for checking the extent of multiple

Figure 6.2: Possession in RoR



17 States/UTs do not show any possession details in RoR

Separate column in RoR to show possession details

- Dadra & Nagar Haveli
- Daman & Diu
- Goa
- Haryana
- Himachal Pradesh
- Karnataka
- Lakshadweep
- Punjab
- Telangana
- Tripura
- West Bengal

Possession details shown in Remarks column in RoR

- Uttar Pradesh

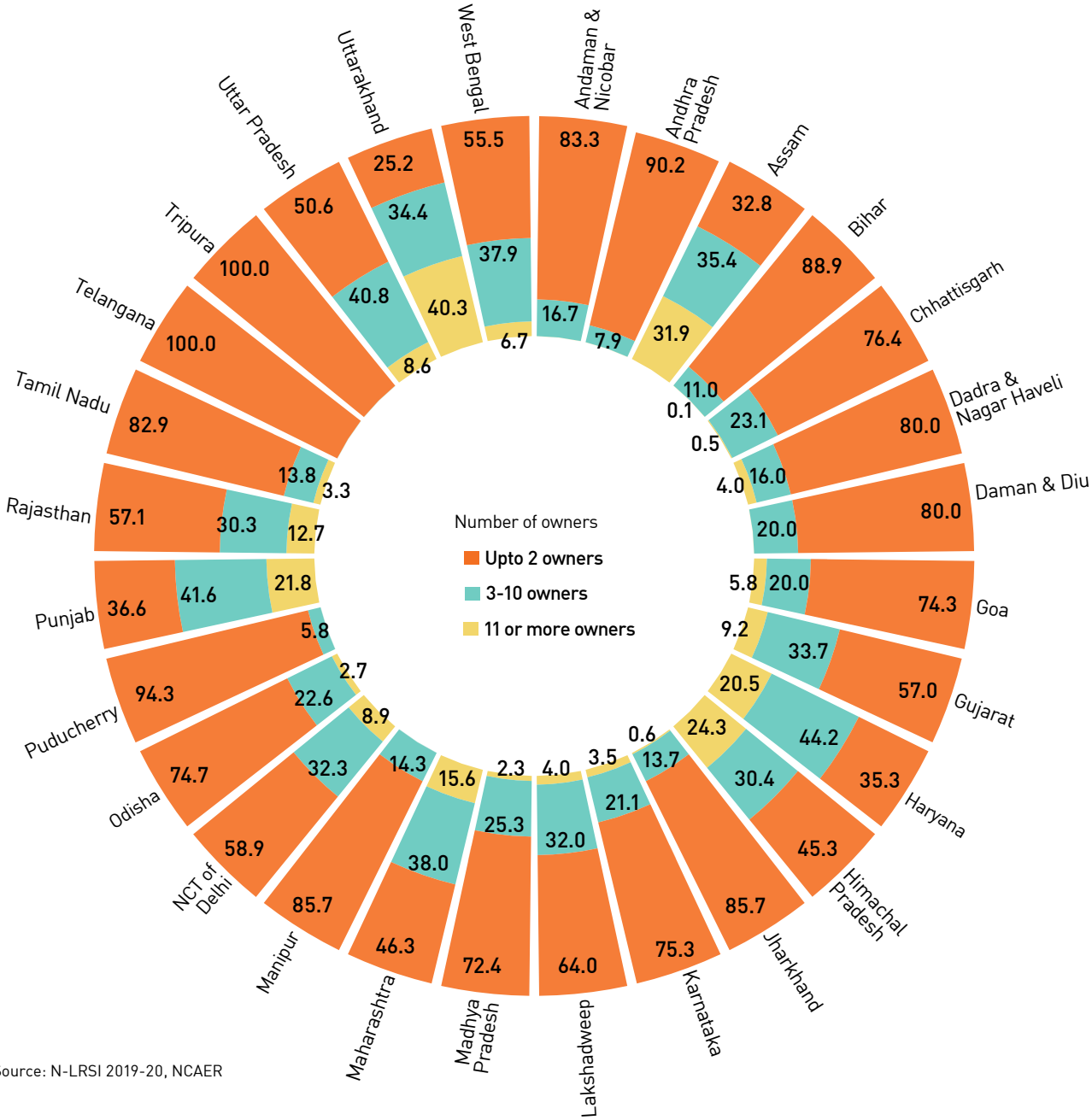
No Possession details shown in RoR

- Andaman & Nicobar
- Andhra Pradesh
- Assam
- Bihar
- Chhattisgarh
- Delhi
- Gujarat
- Jharkhand
- Madhya Pradesh
- Maharashtra
- Manipur
- Odisha
- Puducherry
- Rajasthan
- Tamil Nadu
- Uttarakhand

Source: N-LRSI 2019-20, NCAER

ownership/possession. The States/UTs which scored 100 per cent on this proxy (up to two owners) include Tripura and Telangana. The States/UTs with a relatively higher degree of joint ownership include Uttarakhand, Assam, Himachal Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh, to list a few. In the case of Uttarakhand, the extent of joint ownership even exceeded a count of 200 in a particular case (Figure 6.3). The States/UTs of Jammu & Kashmir, Ladakh, Chandigarh, Sikkim, Arunachal Pradesh, Nagaland, Mizoram, and Meghalaya either do not have a web portal to view the record or do not possess written rural land records. Consequently, they were not included in this analysis.

Figure 6.3: Extent of Joint Ownership (Percentage of Sampled Plots)

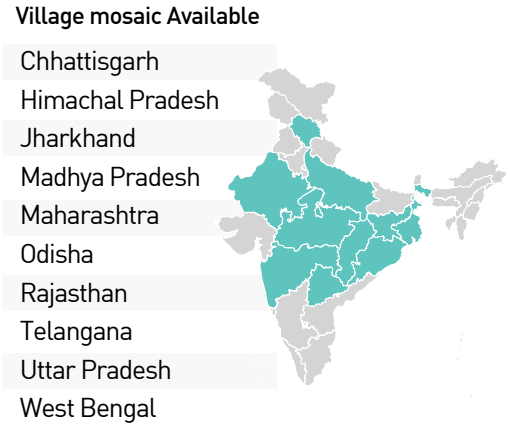


Source: N-LRSI 2019-20, NCAER

6.3. Land Use

An accurate record should immediately capture the on-ground changes in terms of the land use of the plot. In order to capture the extent of accuracy in this regard, this exercise attempted to compare the reported land use with the Google Earth pro map-images of the plots. This consistency check was aimed at distinguishing between agricultural and non-agricultural land use. The checks could be conducted only for the States/UTs that had a land records portal and a mosaic of the villages, as presented in Figure 6.4. The results of the land use congruence for the 10 States/UTs that could be included in this exercise are presented in Figure 6.5.

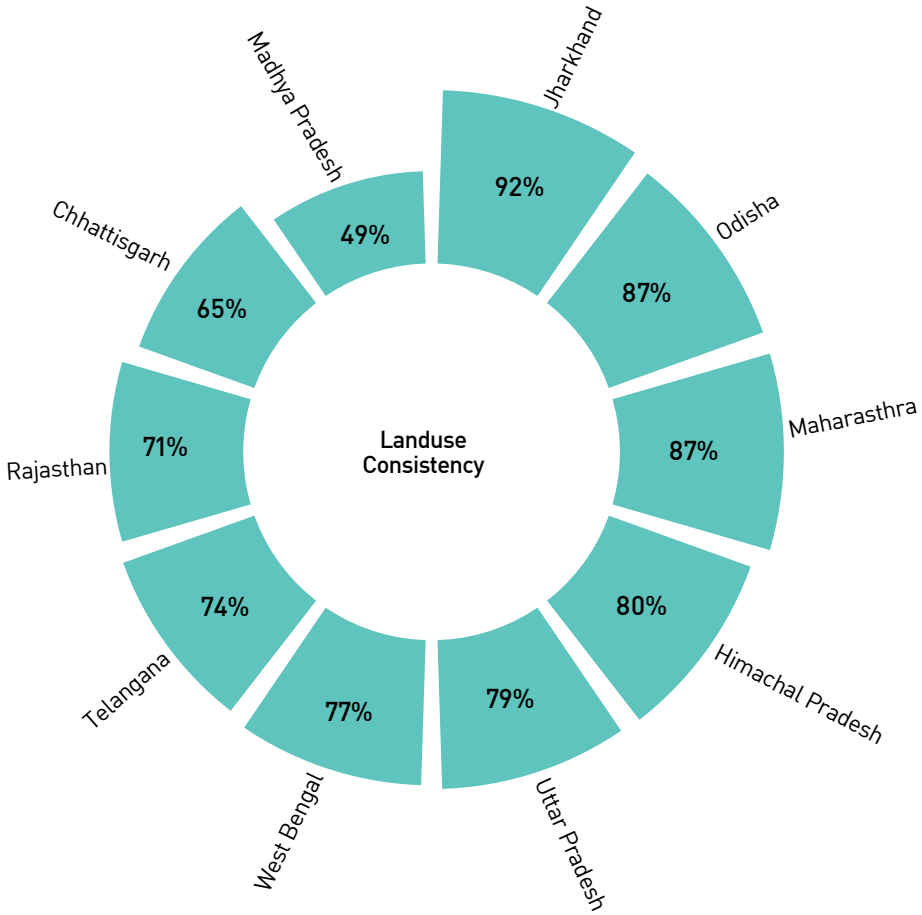
Figure 6.4: Availability of Village Mosaics



Note: CMs in mosaic format are available for Lakshadweep but individual plots are not visible in Google Earth pro.

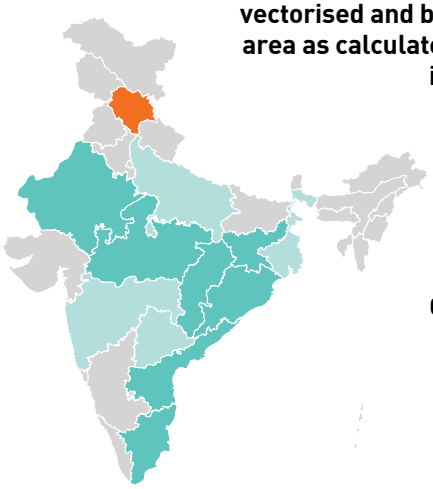
Out of 14 States/UTs with digitised CMs on web, 10 states have village mosaics available

Figure 6.5: Land -use Congruence



Source: N-LRSI 2019-20, NCAER

Figure 6.6: States/UTs with Digitised CMs and their Attributes



States/UTs where the CMs are vectorised and both line lengths and area as calculated from line lengths is shown on the CMs

- Himachal Pradesh

States/UTs where the line lengths are shown but the area is either not mentioned on the CMs or it is identical to that in RoR

- Andhra Pradesh
- Chhattisgarh
- Jharkhand
- Lakshadweep
- Madhya Pradesh
- Odisha
- Rajasthan
- Tamil Nadu

States/UTs where the digitised CMs did not show vectorised line length

- Maharashtra
- Telangana
- Uttar Pradesh
- West Bengal

Source: N-LRSI 2019-20, NCAER

In the case of Himachal Pradesh, it was often difficult to clearly identify plots on the satellite imagery due to the lack of land features on the CMs. This necessitated replacement of sample villages for this test to places with more identifiable features in the CMs. For Jharkhand, the textual record does not provide details of the land use (available in a different tab) and here again, the sample was replaced with records for which land use could be easily identified and compared with the Google Map images.

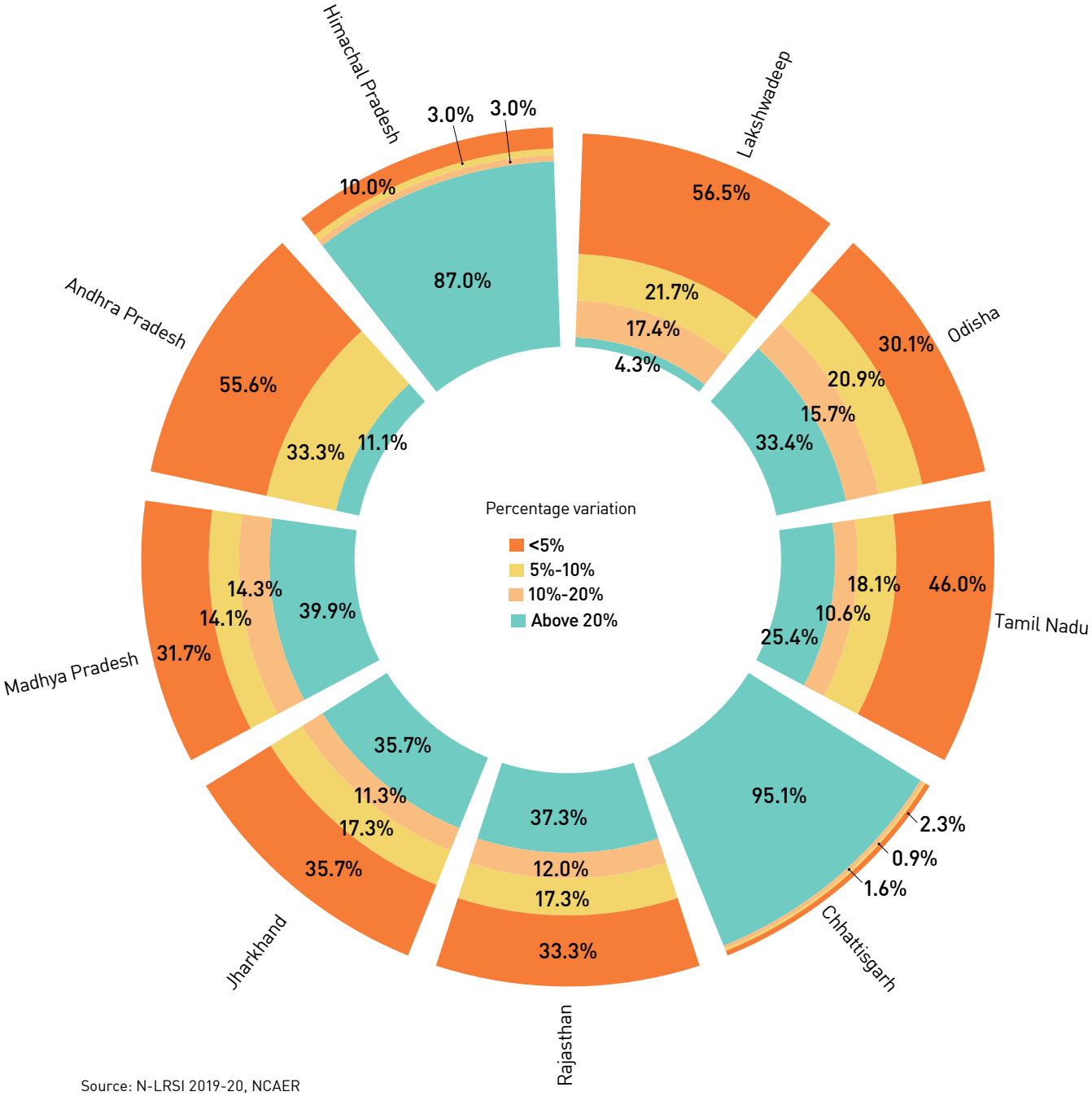
The 10 States/UTs for which the land use was assessed exhibited a high degree of consistency between recorded land use and the use reflected in Google Earth images, with the lowest extent of consistency being exhibited in Madhya Pradesh (largely on account of missing information on land use in the RoRs) (Figure 6.5).

6.4. Land Area

As discussed in Chapter 2, the land area recorded in the RoRs is mostly based on surveys conducted with traditional instruments with a significant possibility of error between the record and the actual on-ground area. This is further compounded by the fact that even in re-surveys, the legacy record of the area is expected to be maintained to reduce the possibility of disputes. The proxy used to assess the gap between the actual land area and that reported in the record is the area of plots provided in the digitised RoRs and CMs.

The extent of congruence between the area shown in the RoR and that in CMs is taken to represent greater or lesser accuracy of the area shown in the RoR. Tests for the extent of this congruence required that States/UTs meet the following two conditions i) the CMs must be digitised; and ii) these must show the vectorised line-lengths of plots. These two would allow for calculation of the area of the digitised plots even if it is not reflected in the CM or it is taken to be identical with that in RoR (as is often the case). The position of States/UTs in this regard is presented in Figure 6.6.

Figure 6.7: Percentage of Plots by Range of Variation between area in ROR and CMs

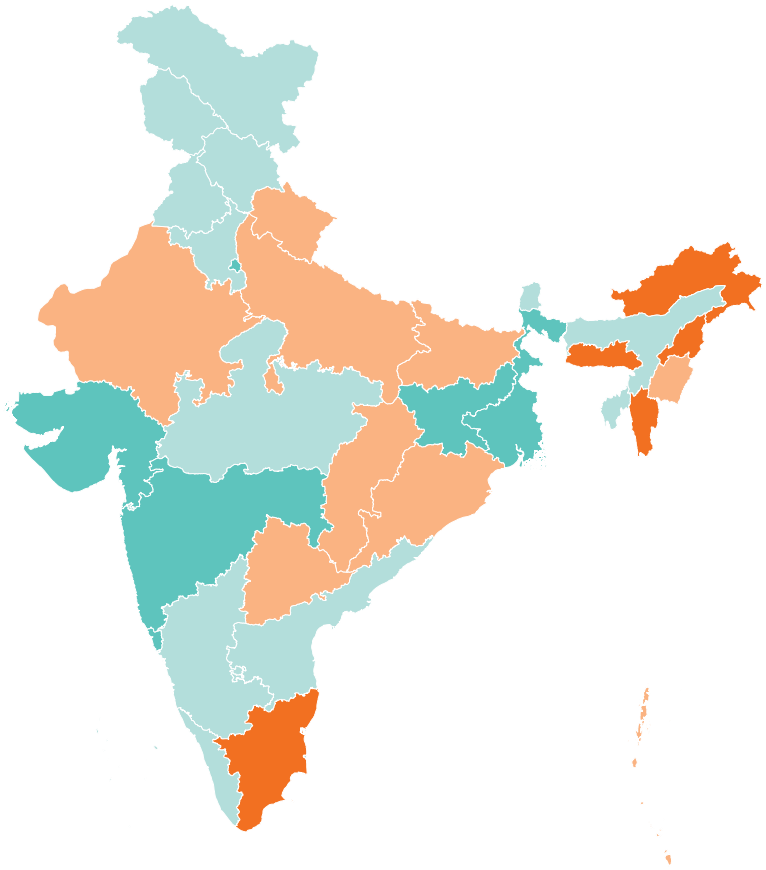


Source: N-LRSI 2019-20, NCAER

As presented in Figure 6.6, the actual test-checks were conducted in respect of only nine States/UTs.

The overall findings show relatively limited congruence in the area of plots between the RoRs and CMs. Figure 6.7 presents the position of the States/UTs on this measure. It shows that 56.6 per cent of the plots assessed exhibited a variation of more than 10 per cent.

Table 6.8: Status of Recording Encumbrances



No Indian State/UT records more than three encumbrances categories in the RoR

Three categories of encumbrances
Delhi
Goa
Gujarat
Jharkhand
Maharashtra
West Bengal

Two categories of encumbrances
Andhra Pradesh
Assam
Chandigarh
Daman & Diu
Haryana
Himachal Pradesh
Jammu & Kashmir
Karnataka
Kerala
Ladakh
Madhya Pradesh
Punjab
Sikkim
Tripura

One category of encumbrances
Andaman & Nicobar
Bihar
Chhattisgarh
Dadra & Nagar Haveli
Lakshadweep
Manipur
Odisha
Puducherry
Rajasthan
Telangana
Uttar Pradesh
Uttarakhand

None of the Encumbrances recorded
Arunachal Pradesh
Meghalaya
Mizoram
Nagaland
Tamil Nadu

Source: N-LRSI 2019-20, NCAER

6.5. Recording Encumbrances

Encumbrances are generally recorded in the 'Remarks' column of the RoRs. Traditionally, only mortgages as a form of encumbrance have received attention. However, other restrictions and conditions related to land are increasingly becoming a source of disputes and enhancing the costs of transactions. The importance of exhibiting them in the land records is also being recognised. This exercise sought information from the KCs on whether instructions exist to show five kinds of encumbrances in the RoR—mortgages, land acquisition proceedings, institution of revenue court cases, institution of civil court cases, and any statutory land use restrictions applicable to a particular plot. The State/UT- wise results have been summarised in Figure 6.8. It is interesting to note that in five States/UTs, even mortgages are not reflected in the RoR and no State or UT records more than three of these encumbrances.

CHAPTER

7

THE N-LRSI – THE FINAL RANKINGS

Chapter 1 introduced the objectives and the rationale for the N-LRSI as an attempt to answer the following questions:

- What is the actual extent of digitisation of land records and the registration process?
- What improvements have been brought about by the digitisation process in some basic citizen services related to land records?
- What improvements have been brought about by the digitisation process in creating a more up-to-date and accurate record?

Chapter 2 explained the methodology and process for construction of the N-LRSI. Chapters 3 to 6 presented the results of the exercise undertaken to assess these aspects:

- The extent of digitisation of textual records (RoRs);
- The extent of digitisation of spatial records (CMs);
- The extent of digitisation of the five identified stages of the registration process; and
- The quality of the land records as gauged on an identified set of five indicators.

Table 7.1 recapitulates the design and structure of N-LRSI presented in Chapter 2.

Table 7.1: N-LRSI Parameters, Weights and Mode of Evaluation

(Maximum points =100)

PARTICULARS	POINTS	EVALUATION METHOD		
		Desk research	KCs	Test Checks
TEXTUAL RECORD				
a. Digitisation of Records of Rights (RoRs)	15	●	●	●
b. Availability of legally useable copies of RoRs	5	○	●	○
SPATIAL RECORD				
a. Digitisation of Cadastral Maps (CMs)	15	●	●	●
b. Availability of legally useable copies of CMs	5	○	●	○
REGISTRATION				
a. Public Entry of Data	4	●	●	○
b. Availability of Circle Rates	4	○	○	●
c. Mode of Payment of Stamp Duty / Registration Fee	4	●	●	○
d. Digital Attestation of Document by Sub Registrar office (SRO)	4	○	●	○
e. On-line Delivery of Registered Document	4	○	●	○
QUALITY OF LAND RECORDS				
a. Updating Ownership	5	○	●	○
b. Extent of Joint Ownership	10	○	○	●
c. Land Use	10	○	○	●
d. Land Area	10	○	○	●
e. Recording Encumbrances	5	○	●	○

NOTE: KCs – Knowledge Correspondents (KCs were contacted under this exercise to obtain and advise on specific questions about the status and process of land records in the States/UTs; and they variously comprised senior officers, other retired and serving revenue officers and/or experts with knowledge of land matters in the relevant State / UT.) ; Source: N-LRSI 2019-20, NCAER

2 States/ UTs have obtained 15 points (out of 15) for extent of RoR digitization component

Against the maximum points assigned to the N-LRSI components and sub-components, this chapter presents the score that each State/UT obtained based on the achievements described in the previous chapters.

7.1. Extent of Digitisation of RoRs

As mentioned in Table 7.1., this component has two sub-components as follows:

1) Extent of digitisation computed on the basis of area with land records, reported RoR digitisation, and the success rate of the test-checks, and

2) The status of availability of legally usable copies of RoRs.

For achieving the objective listed in point (i) above, the first step was to determine the area of the State/UT with land records and to calculate its proportion in the 15 points allocated for this purpose. Thereafter, the proportion of digitisation computed after the test-checks was taken as a percentage of the net figure obtained in the first step. The points obtained by each State/UT are exhibited in Figure 7.1.

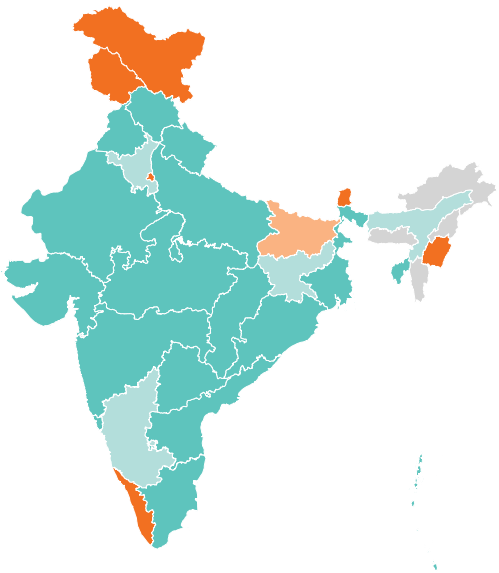


Figure 7.1 Extent of RoR Digitisation (after measurement by the Dipstick Tests)

States/UTs	Score for Digitisation of Records of Rights (RoRs) (out of 15)
Dadra & Nagar Haveli	15.0
Odisha	15.0
Chhattisgarh	14.4
Goa	14.2
Andhra Pradesh	14.0
Madhya Pradesh	14.0
Gujarat	14.0
Tamil Nadu	13.9
Maharashtra	13.9
Puducherry	13.8
Rajasthan	13.7
Uttar Pradesh	13.7
Uttarakhand	13.6
Tripura	13.6
West Bengal	13.3
Andaman & Nicobar	12.9
Punjab	12.7
Lakshadweep	12.6
Telangana	12.5
Himachal Pradesh	12.5
Daman & Diu	11.8
Karnataka	11.1
Haryana	10.7
Jharkhand	10.5
Assam	7.9
Bihar	6.8
NCT of Delhi	3.5
Manipur	1.8
Chandigarh	0.0
Jammu & Kashmir	0.0
Kerala	0.0
Ladakh	0.0
Sikkim	0.0

Source: N-LRSI 2019-20, NCAER

As regards the availability of the legally usable copies of RoRs, the points have been awarded as per the process described below. Five points, if such copies are downloadable directly from the web, and 2.5 points if such copies have to be obtained from the CSCs. The States/UTs where neither option is available have not been awarded any points for this. The final scores for the extent of RoR digitisation have been presented in Figure (7.2), with the details contained in Annexure Table A7.1. The average final score exhibiting the extent of RoR digitisation, combined with its legal usability is a respectable 14.4 out of the maximum 20, for 28 States/UTs. The five States/UTs scoring the highest in this regard were Dadra and Nagar Haveli, Chhattisgarh, Goa, Madhya Pradesh, and Tamil Nadu, with an average score of 19.3. At the other end, the five States/UTs of Manipur, Assam, Bihar, Delhi, and Jharkhand had an average score of just 7.1 points.

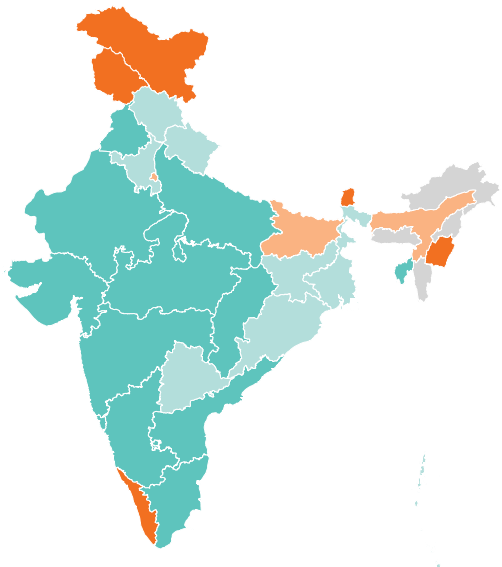


Figure 7.2: Extent of RoR Digitisation and Availability of Legally Useable Copies (Final score)

States/Uts	Score for Textual Record (out of 20)
Dadra & Nagar Haveli	20.0
Chhattisgarh	19.4
Goa	19.2
Madhya Pradesh	19.0
Tamil Nadu	18.9
Maharashtra	18.9
Uttar Pradesh	18.7
Andhra Pradesh	16.5
Gujarat	16.5
Puducherry	16.3
Rajasthan	16.2
Tripura	16.1
Karnataka	16.1
Punjab	15.2
Telangana	15.0
Odisha	15.0
Himachal Pradesh	15.0
Daman & Diu	14.3
Uttarakhand	13.6
West Bengal	13.3
Andaman & Nicobar	12.9
Lakshadweep	12.6
Haryana	10.7
Jharkhand	10.5
NCT of Delhi	8.5
Assam	7.9
Bihar	6.8
Manipur	1.8
Kerala	0.0
Chandigarh	0.0
Sikkim	0.0
Jammu & Kashmir	0.0
Ladakh	0.0

Source: N-LRSI 2019-20, NCAER

The average final score exhibiting the extent of RoR digitisation, combined with its legal usability is a respectable 14.4 out of the maximum 20

Figure 7.3 Extent of CM Digitisation (after measurement by the Dipstick Tests)

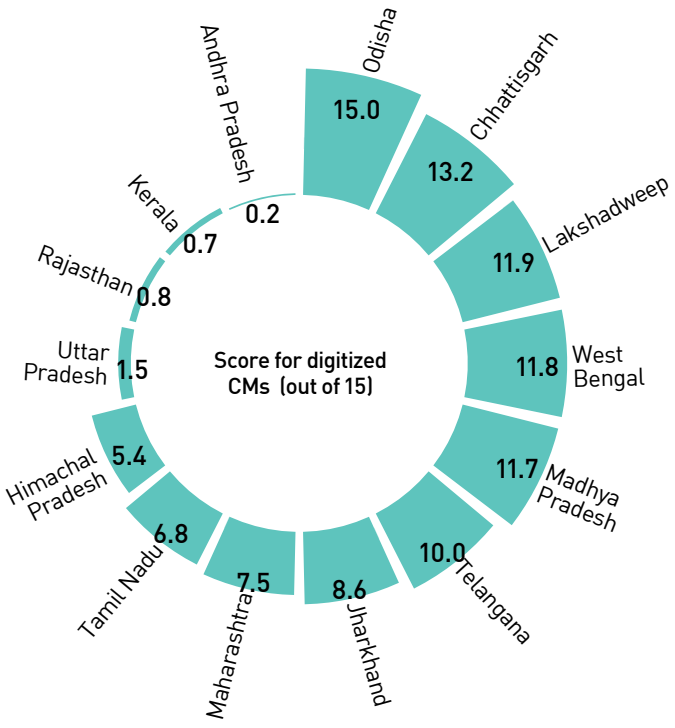
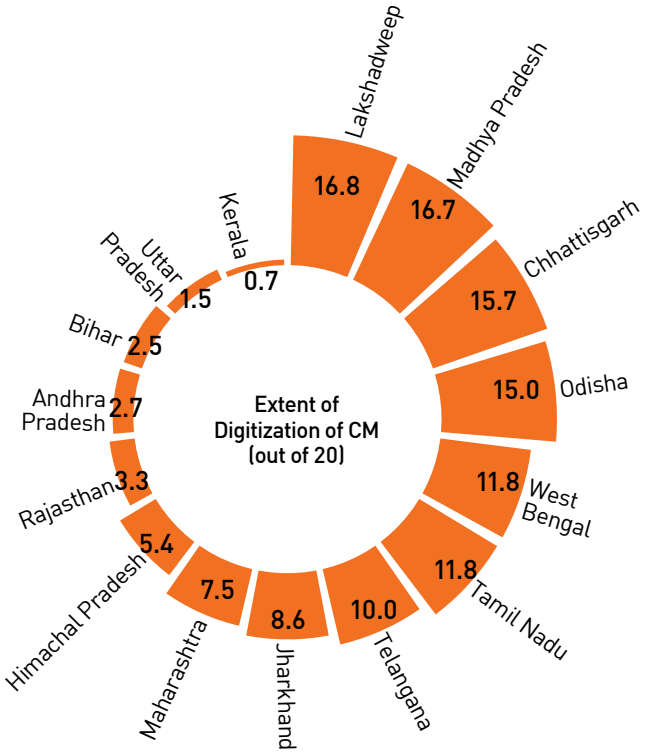


Figure 7.4 Extent of CM Digitisation and Availability of Legally Useable Copies (Combined score)



Source: N-LRSI 2019-20, NCAER

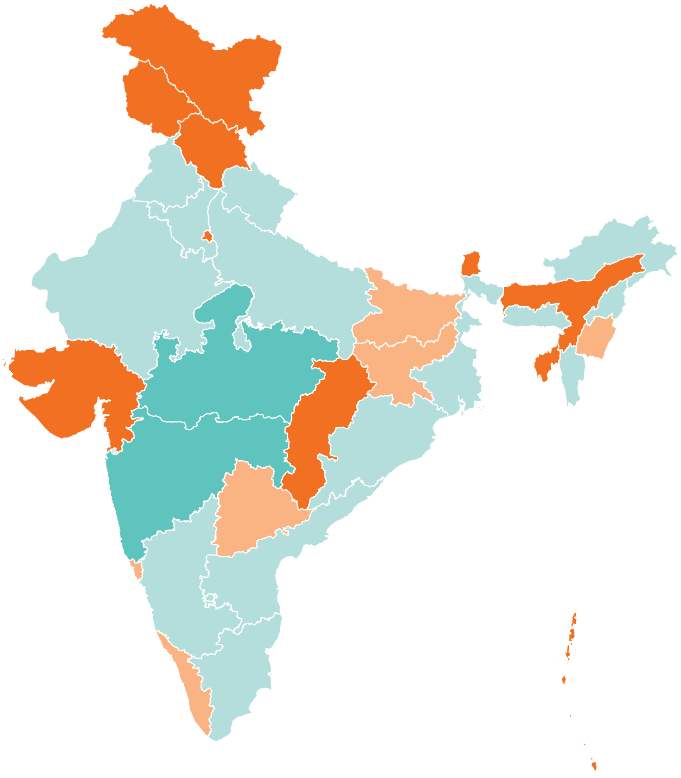
7.2. Extent of Digitisation of CMs

The computation of points has been done in the same manner as in the case of RoRs. As mentioned in Chapter 4, only 14 States/UTs exhibited digitised CMs in their accessible web portals. The points obtained by each of these States/UTs are exhibited in Figure 7.3.

Points for the availability of legally usable copies of CMs have been awarded on the same basis as in the case of RoRs.

The final scores for the extent of digitisation of CMs have been presented in Figure 7.4, with the details are contained in Annexure Table A7.2. The average final score exhibiting the extent of CM digitisation, combined with its legal usability was only 9.1 out of the maximum of 20, for the 14 States/ UTs. The top three States/ UTs in this regard were Lakshadweep, Madhya Pradesh, and Chhattisgarh, with an average score of 16.4 points, while the bottom three States are Kerala, Uttar Pradesh, and Andhra Pradesh, which had an average score of just 1.6 points. Overall, there was quite a considerable gap in digitisation of textual and spatial land records across India.

Figure 7.5: Extent of Digitisation of the Registration Process



Source: N-LRSI 2019-20, NCAER

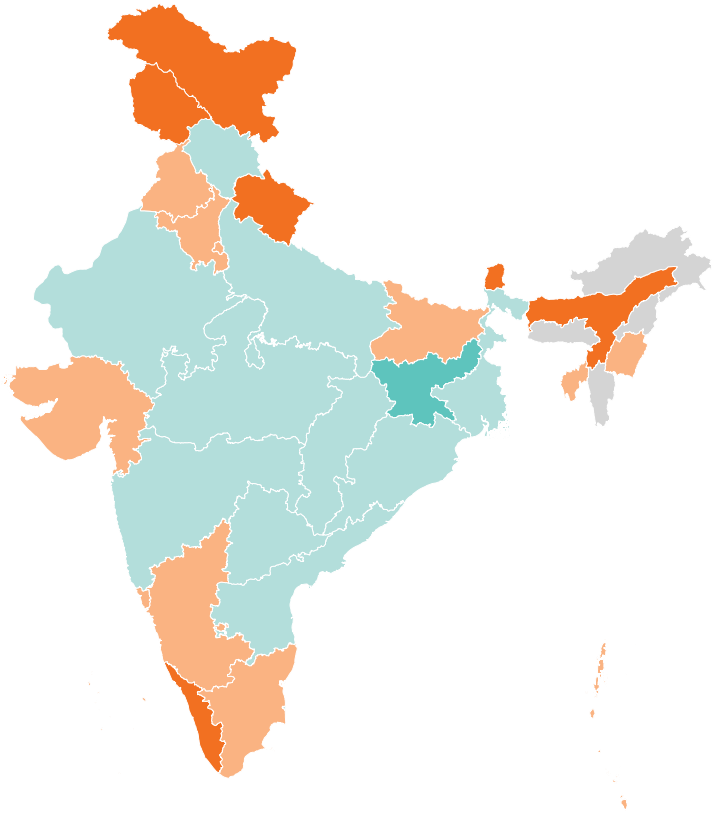
States/UTs	Score for Registration (out of 20)
Maharashtra	15.7
Madhya Pradesh	15.6
West Bengal	14.9
Uttarakhand	13.6
Andhra Pradesh	13.6
Tamil Nadu	12.5
Haryana	11.8
Rajasthan	11.7
Uttar Pradesh	11.2
Odisha	11.2
Karnataka	11.1
Punjab	10.8
Manipur	10.0
Telangana	9.3
Jharkhand	9.0
Goa	7.7
Bihar	7.5
Kerala	5.5
Puducherry	5.2
Himachal Pradesh	5.0
Chhattisgarh	4.7
Gujarat	4.7
Tripura	4.0
Chandigarh	4.0
Sikkim	3.9
Jammu & Kashmir	2.3
Dadra & Nagar Haveli	2.0
Daman & Diu	2.0
Andaman & Nicobar	2.0
NCT of Delhi	2.0
Assam	2.0
Lakshadweep	0.0
Ladakh	0.0

7.3. Digitisation of the Registration Process

As discussed in Chapter 5, the registration process was divided into five stages and the extent of digitisation has been gauged on all the five stages separately, with a maximum of 4 points accorded for each step.

Based on the assessment discussed in Chapter 5, the points scored, both on each step and overall for the registration process, have been shown in Annexure Table A7.3. The composite points obtained by the States/UTs have been reflected in Figure 7.5. The average registration score across the 31 States/UTs was only 8. However, the States of Maharashtra, Madhya Pradesh, West Bengal, Uttarakhand, and Andhra Pradesh, with an average of 14.9 points, scored well on this component. The other States/UTs scored relatively poorly, with the bottom five, comprising Andaman and Nicobar Islands, Delhi, Daman and Diu, Dadra and Nagar Haveli, and Assam, scoring an average of only 2 points.

Figure 7.6: Scores for Proxy Indicators of Quality of the Land Records



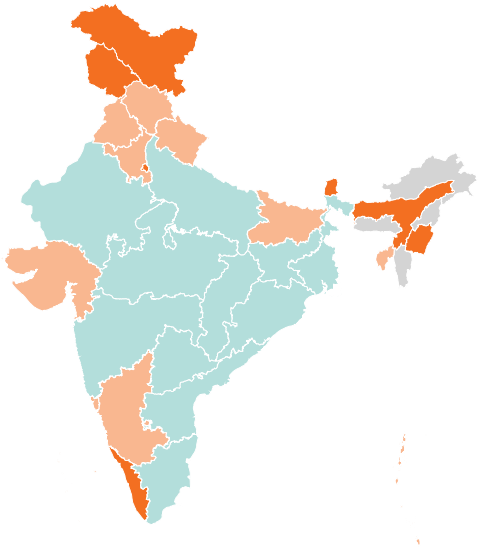
Source: N-LRSI 2019-20, NCAER

States/UTs	Score for Quality of Land Records (out of 40)
Jharkhand	31.2
Odisha	26.3
Rajasthan	25.3
Chhattisgarh	24.3
Madhya Pradesh	23.7
Maharashtra	23.2
Himachal Pradesh	22.2
West Bengal	21.8
Andhra Pradesh	21.1
Telangana	20.9
Uttar Pradesh	20.9
Tamil Nadu	19.8
Lakshadweep	18.4
Punjab	14.4
Goa	14.4
Gujarat	13.9
Daman & Diu	13.9
Karnataka	13.7
Tripura	13.3
Haryana	12.9
Bihar	12.0
NCT of Delhi	11.6
Puducherry	10.8
Andaman & Nicobar	10.5
Manipur	10.1
Dadra & Nagar Haveli	10.0
Assam	9.5
Uttarakhand	8.9
Kerala	4.5
Chandigarh	2.0
Sikkim	2.0
Jammu & Kashmir	2.0
Ladakh	2.0

7.4. Quality of the Land Records

The status of different States/UTs with regard to the five elements of the record studied in this exercise was discussed in Chapter 6. As a result, the points obtained by the States/UTs on the five parameters and overall can be seen in Annexure Table A7.4. The respective scores of the States/UTs are shown in Figure 7.6. The average score for land records was only 15.1 out of a maximum possible score of 40. The States that exhibited the best quality of records as assessed on the basis of the proxy indicators used were Chhattisgarh, Rajasthan, Jharkhand, Odisha, and Madhya Pradesh, with an average score of 26.1 points. At the bottom, the five States/UTs of Kerala, Chandigarh, Jammu and Kashmir, Ladakh, and Sikkim had an average score of only 2.9 points.

Figure 7.7: N-LRSI 2019-20



N-LRSI Rank	States/Uts	N-LRSI Score
1	Madhya Pradesh	74.9
2	Odisha	67.5
3	Maharashtra	65.3
4	Chhattisgarh	64.1
5	Tamil Nadu	63.0
6	West Bengal	61.8
7	Jharkhand	59.2
8	Rajasthan	56.5
9	Telangana	55.3
10	Andhra Pradesh	53.9
11	Uttar Pradesh	52.2
12	Lakshadweep	47.9
13	Himachal Pradesh	47.5
14	Goa	41.3
15	Karnataka	40.9
16	Punjab	40.5
17	Uttarakhand	36.1
18	Haryana	35.3
19	Gujarat	35.0
20	Tripura	33.4
21	Puducherry	32.3
22	Dadra & Nagar Haveli	32.0
23	Daman & Diu	30.1
24	Bihar	28.8
25	Andaman & Nicobar	25.4
26	NCT of Delhi	22.1
27	Manipur	21.9
28	Assam	19.4
29	Kerala	10.7
30	Chandigarh	6.0
31	Sikkim	5.9
32	Jammu & Kashmir	4.3
33	Ladakh	2.0

Average 38.56

Source: N-LRSI 2019-20, NCAER

7.5. Overall N-LRSI Scores

The overall N-LRSI scores based on all the components are presented in Figure 7.7. The average N-LRSI score across 33 States/UTs was 38.6 out of the maximum possible score of 100 points. The top five States were Madhya Pradesh, Odisha, Maharashtra, Chhattisgarh, and Tamil Nadu. All these States reported 100 per cent digitisation of RoRs on the DoLR website and three out of these States (Odisha, Chhattisgarh, and Madhya Pradesh) reported 100 per cent digitisation of CMs on the DoLR website. The average score of the top five States was 66.9 points. Many of the States/UTs below them had gaps along various dimensions that can be made up quite quickly, enabling them to catch up with the leaders.

The States/UTs at the bottom of the N-LRSI rankings were Kerala, Chandigarh, Sikkim, Jammu and Kashmir, and Ladakh. Their average score is 5.8 points. Of these five, Sikkim reported 100

The average N-LRSI score of the top five States is 66.9 points

per cent digitisation of land records and an advanced stage of computerisation of registration, but had not yet posted details of this achievement on the web.

Kerala reported digitisation of land records but accessing this record posed problems. Chandigarh had started digitising the registration process and holds promise of catching up with the rest of the country. Jammu & Kashmir and Ladakh were still to make a significant effort in the digitisation process. Goa and Manipur showed dynamism in recent times, with the potential to show significant progress in a very short period of time.

7.6. Sensitivity Analysis

A sensitivity analysis was carried out on the following key parameters:

1) Changing the weightage between the "extent of digitisation" and "quality of land records" to 50: 50 instead of the 60: 40 used in the original Index as presented; and

2) Impact of selected indicators, as well as cumulative effect of all indicators, pertaining to the quality of land records.

The impact of these scenarios are presented in this section.

Scenario 1: Change in weightage of extent of digitisation and quality of land records

The current N-LRSI methodology accords 60 per cent weightage to the "extent of digitisation", and 40 per cent to the "quality of land records". To check for the sensitivity of the index values and ranking of the States/UTs to the weights, the index was changed to provide equal weightage of 50 per cent each.

Scenario 2: Exclusion of encumbrances and updating ownership from quality of land records

As discussed in Chapter 2, two out of five sub-components of the "quality of land

Table 7.2: Sensitivity Analysis

↗ GAIN ↘ LOSS

Original rankings	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Top-Five States	Change in weights to Extent of Digitization and Quality of Land Records	Exclusion of encumbrances and Updating ownership from Quality of Land Records	Exclusion of Extent of joint ownership from Quality of Land Records	Exclusion of Extent of joint ownership, encumbrances and Updating ownership from Quality of Land Records
Madhya Pradesh	Madhya Pradesh	Madhya Pradesh	Madhya Pradesh	Madhya Pradesh
Odisha	Odisha	Odisha	Odisha	Odisha
Maharashtra	Maharashtra	↗ Chhattisgarh	Maharashtra	↗ Chhattisgarh
Chhattisgarh	Chhattisgarh	↗ Tamil Nadu	Chhattisgarh	↘ Maharashtra
Tamil Nadu	↗ Jharkhand	↘ Maharashtra	↗ West Bengal	↘ Jharkhand

Source: N-LRSI 2019-20, NCAER

records" are derived from the information obtained from the KCs. Sensitivity analysis was carried out by removing the scores for these two sub-components from the "quality of land records".

Scenario 3: Exclusion of extent of joint ownership from quality of land records

The third scenario for sensitivity analysis entailed exclusion of the extent of joint ownership from the index calculation and arriving at the final score with modified values for the "quality of land records".

Scenario 4: Exclusion of extent of joint ownership, encumbrances and updating ownership from quality of land records

The last scenario for sensitivity analysis was a combination of the second and third scenarios, and excluded joint ownership, encumbrances, and updating ownership from the "quality of land records" component of the N-LRSI. In this scenario, quality of land records consists of only the mapping-based verification checks—land use and land area/extent. The final index values were obtained from the normalised scores for these two checks of quality of land records.

Table 7.2 summarises the results of the sensitivity analysis and places the top five and the bottom five States/UTs based on the original N-LRSI values as well as for different scenarios of the sensitivity analysis (detailed scores and rankings are provided in Annexures A7.5 to A7.8).

The sensitivity analysis reveals that four out of the top five States/UTs retain their position under these different scenarios. Jharkhand moves into the top five from the seventh spot under Scenarios 1 and 4; and West Bengal, ranked sixth, moves up into the top five under Scenario 3.

The bottom five States/UTs also remain unchanged in all the four cases of sensitivity analysis. The position of other States/UTs does not change significantly.

The sensitivity analysis reveals that four out of the top five States/UTs retain their position under these different scenarios

CHAPTER

8

EMERGING IMPACT OF THE DIGITAL: IMPROVING ACCESS AND SERVICES

This chapter summarizes the DI-LRMP guidelines on the standards prescribed for States/UTs and how these efforts are intended to benefit citizens. It further discusses the problems and obstacles faced in accessing land record services provided by the websites of the States/UTs.

8.1. DI-LRMP Guidelines for States/UTs

The National Land Records Modernisation Programme (NLRMP), approved in 2008 as a Centrally Sponsored Scheme, has since been revamped as the Digital India Land Records Modernisation Programme (DI-LRMP) as a Central Sector Scheme, with 100 per cent funding from the Government of India with effect from April 1, 2016. The programme has the following major components:

i) Computerisation of land records;

ii) Survey/re-survey and updation of the survey and settlement records (including the ground control network and ground truthing);

iii) Computerisation of registration;

iv) Modern record rooms/land record management centres at the tehsil/taluka/circle/block level;

v) Training and capacity building;

vi) Core GIS;

vii) Legal changes; and

viii) Programme management.

The DoLR Guidelines (2018–19) comprise the following three parts: Part A (Guidelines), Part B (Technical Manuals), and Part C (MIS). These collectively provide instructions to the States/UTs to enable proper implementation, including the supply-side aspects of business processes, software standards, and MIS. The standards and targets set out also indicate how these efforts will ultimately also benefit citizens. Box 8.1 presents the highlights of these Guidelines.

DILRMP—Benefits to Citizens

Citizens are expected to benefit from the DI-LRMP programme in a number of ways, as listed below.

- The foremost benefit is expected to be the availability of real-time and tamper-proof land ownership records, and citizens can also enquire about the current and past ownership of these records.

- Since the records will be placed on the websites with proper security IDs, property owners will have free access to their records without any compromise on the confidentiality of the information.

- The Public–Private Partnership (PPP) mode of service delivery is further expected to make the citizen interface with the portals more efficient and free of hassles. The single-window service or the web-enabled "anytime-anywhere" access is expected to not only drastically reduce the time taken in for obtaining RoRs but also to minimise manual interactions with officers, agents, and others, thereby reducing rent-seeking and delays.

- The abolition of stamp papers and payment of stamp duty and registration fees through banks, and Internet gateways, among other steps, are expected to reduce the interface with the registration machinery, and with market-value information freely

The Public–Private Partnership (PPP) mode of service delivery is expected to make the citizen interface with the portals

Box 8.1: DI-LRMP Guidelines–Key Features

The DoLR Guidelines suggest the following steps for the States/UTs to follow:

1. Identify a nodal Department for purposes of receipt of Central and State funding for the DILRMP and for implementing the same. This Department shall, in turn, put in place a Programme Management Unit (PMU) in the charge of an Officer not below the rank of Secretary, to oversee the DILRMP in its entirety.
2. Set up a State-level Monitoring and Review Committee for the DILRMP to monitor and review the progress of the implementation of the programme, facilitate coordination and the necessary process re-engineering and to provide guidance, wherever required.
3. Take the district as the unit of implementation of the DILRMP.
4. Prioritize the activities under the DILRMP in the chosen district(s) in the systematic, ladder-like manner, as indicated in the Annexure-GL-I of the guidelines.
5. Set up a District-level Monitoring and Review Committee in each district covered under the DILRMP, under the Chairpersonship of the District Collector/Deputy Commissioner to review the progress of implementation of the programme on a regular basis.
6. Ensure submission of online monitoring reports from the District Collector/Deputy Commissioner of each district covered under the DILRMP, to the nodal department of the State Government/UT Administration, which, in turn, will submit the necessary monthly progress reports.
7. Carry out concurrent evaluation and impact assessment in each district covered under the DILRMP and intimate the results to the DoLR.
8. Bring the district(s) where the DILRMP activities have been completed under the law for conclusive titling.
9. Make a Perspective Plan indicating the time frame within which the State/UT administration will cover all its districts under the DILRMP, preferably by 2019–20.
10. Undertake all process re-engineering involved in implementing the DILRMP, including legal changes, wherever required.
11. Undertake all necessary action for capacity building of the staff to ensure that the DILRMP is implemented properly.
12. Make positive efforts towards deployment of the Revenue, Survey, and Registration staff for their designated tasks under the DILRMP.
13. Provide "single window" service to citizens for distribution of RoRs and for registration.
14. Set up a Core Technical Advisory Group for providing technical guidance in implementing the DILRMP.
15. Place the updated property records on the official website(s) in such a manner that property owner(s)/enjoyer(s) have access to their property records.
16. Make a time-bound programme for abolition of stamp paper and introduce payment of stamp duty and registration fees through banks/ treasuries.

In addition to the above, any irregularity brought to the notice of the State Government/UT administration shall be enquired into promptly and corrective action taken thereupon.

Source: DoLR Guidelines, 2018-19.

available on public websites, citizens are less likely to face opacity in computations or manual errors.

- Automatic and/or swift mutations will significantly reduce the scope of fraudulent property deals.

- The other benefits include ability to obtain certificates based on land data (for example, information on domicile, caste, and income, among other things) for loans and insurance, eligibility information for obtaining benefits under Government programmes, and so on.

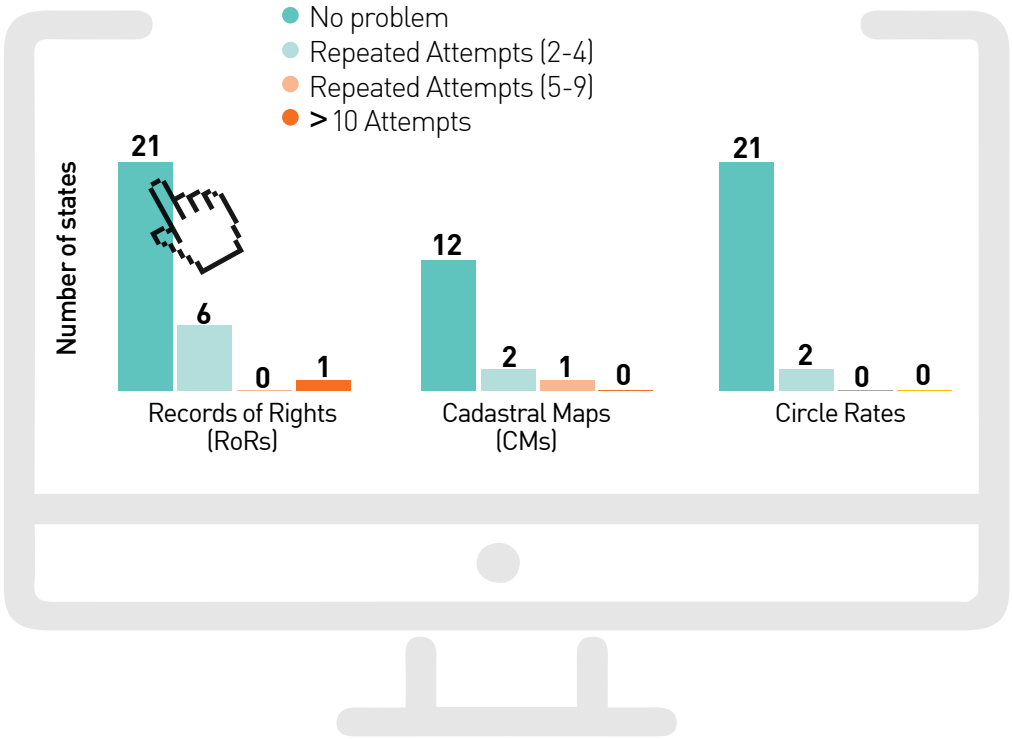
Therefore, the DI-LRMP not only intends to achieve comprehensive record-keeping and management of transactions relating to land and property but also provides a host of benefits to citizens by making data and documentation accessible to them, for myriad end-uses. The fundamental condition of being able to achieve this is whether and to what extent are land related documents and transactions easily accessible to citizens.

8.2. Access to Land Records-related Services

8.2.1. Access to Websites/Portals of States/UTs

The problems described in this section are intended to highlight ease of access to the State portals. No marks have been deducted/awarded on account of these issues. However, these are the areas where

Figure 8.1: Distribution of States/UTs on Ease of Access to Server for ROR, CM and CR



Note: Out of 31 States/UTs reporting digitisation of RORs, three States/UTs either do not have portals or these are inaccessible.
Source: N-LRSI 2019-20, NCAER

Although for a majority of the States/ UTs, the documents were accessible on the portals, a failure rate for more than 10 per cent of the sample villages was reported from eight States/UTs for RORs, and from 12 States/UTs for CMs

quick improvements need to be made. The access barriers have been classified into four categories: access to the server and records, time taken for accessing records, language and simplicity, and user-interface issues.

a) Ease of Access to Server and Documents

In accessing RORs on the State/UT portals, a majority of the States/UTs (21) reported facing no major problems, except for Kerala, where the RORs were not accessible. Figure 8.1 presents the status of the State/UTs portals. In the case of Haryana, RORs were mostly accessible but only after the user made more than ten attempts. Maharashtra, on the other hand, reported website down-time on some occasions when attempts were made to access the site.

In the case of CMs, 12 States/UTs reported no problems in accessing the documents from the websites, whereas Jharkhand required repeat attempts ranging from 5 to 9 times. In Assam, the CMs could not be accessed online at all. Circle rates were easily accessible in the case of 21 States/ UTs, as reported during the test-checks.

Although for a majority of the States/ UTs, the documents were accessible on the portals, yet as described in Chapter 3, a failure rate for more than 10 per cent of the sample villages was reported from eight States/UTs for RORs, and from 12 States/UTs for CMs. A generous 10 per cent threshold has been adopted in this exercise whereas in practice, this can cause a serious inconvenience for a citizen-user attempting to locate her record. Many State/UT portals presented problems of mismatch of administrative units and names.

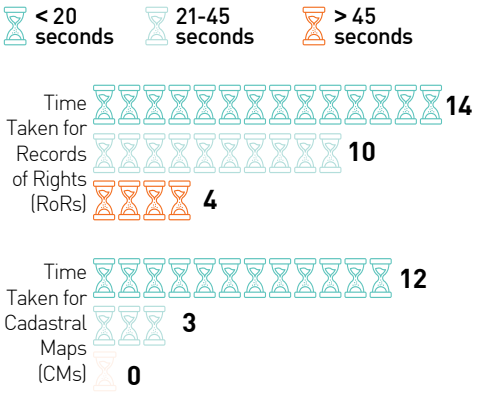
b) Timing and Time Taken

Not much variation was reported in the time taken for RoRs/CMs to fully appear on screen between the daylight hours and midnight hours. Even where a difference was reported between the timings of two recordings, the variation was reported to be marginal (that is, of only up to 5 seconds) with the RoRs being slightly on the higher side than the CMs. In a majority of the States/UTs where test-checks were performed for the CMs, the records were easily accessible within 20 seconds. However, in the case of RoRs, four States/ UTs reported slightly longer time (more

Mis-match of Administrative Units and Names/Spellings

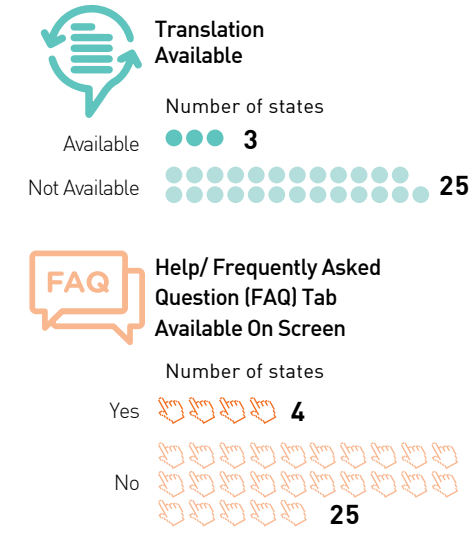
Another set of problems in accessing websites and records arose due to administrative changes that were not reflected across all the databases, which prevented the records from being easily accessible online. For instance, village names that were in the State/UT's report to the DoLR, were not available in their own portals/websites in the same tehsil if administrative changes were effected. This was also the case when district names were changed but commensurate changes were not made in the records' databases, and/or new districts were created but legacy records continued online. In many cases, records for the Gram Panchayat were available but the revenue village selected in the sample did not have a unique land record. Even in cases where sample villages were available on the portal, there were mis-matches in the spellings and names of villages. Although dealing with such issues was time-consuming, the study team resolved the problem by taking fresh samples through the randomised procedure and performing repeated test-checks.

Figure 8.2: Distribution of States/UTs: Time Taken to Access Server



Source: N-LRSI 2019-20, NCAER

Figure 8.3: Distribution of States/UTs on Ease of Access: Simplicity and Language



Source: N-LRSI 2019-20, NCAER

than 45 seconds) taken to download the data, whereas in the remaining 24 States/UTs, it was done within 45 seconds, as illustrated in Figure 8.2. It may be noted that the time/timing issue cropped up only after gaining access to the portals (as explained in point 'a' above).

c) Simplicity and Language

Difficulties in understanding the language in which the websites were organised, were also reported during the test-checks. Although this did not pose much of a hindrance, only four States/UTs had an on-screen 'Help/Frequently Asked Questions (FAQs)' facility to assist the users. The balance 25 States/UTs did not have any such on-screen aid, making it potentially difficult for users to figure out which tab to click, and where/how to look for information that they wanted (Figure 8.3).

Some of the portals provided the facility of translation whereas most did not. Site translations (or bilingual facilities, typically available in the local State/UT language and English) were available only on the portals of West Bengal, Telangana, and Tamil Nadu. The Delhi website had a mix of English and Hindi but none of the other 25 States/UTs had an accurate translation facility, a must for land records. It may be noted that the Google-translate feature popped up in case of many of the State/UT portals but resulted in frequent inaccurate translations, for example, Dhalai district in Tripura became "washing", "mouzas" became "socks", and districts in Andhra Pradesh became "Dark" or "Brightness"!

In addition, except for Gujarat and Rajasthan, the portals of all the other States/UTs had a reasonably simple procedure of filling the titles of fields/records, if the language barrier could be surmounted.

d) User Interface

It has been observed that in order to access information on the State/UT web portals, users need to enter certain details about themselves or location, etc., for which they need to provide various levels of entries. While carrying out the test-checks, it

Site translations were available only on the portals of West Bengal, Telangana, and Tamil Nadu, whereas Delhi website had a mix of English and Hindi language

Except Maharashtra, none of the States/UTs require any identification proof for accessing the required information

was found that for accessing the RoRs/CMs, only five States/UTs reported the requirement of up to four level of entries by users, while in a majority of the cases (16 States/UTs for RoRs and seven States/UTs for CMs), these documents were accessible by making entries of up to 5-6 levels, as presented in Figure 8.4. Seven States/UTs even reported requiring up to seven or more level of entries to access the RoRs. On testing whether identification is required for accessing the RoR/CM data, it was found that except Maharashtra, where a phone number is required, none of the States/UTs require any identification proof for accessing the required information. Although identification proof is not mandatory for most of the States/UTs, yet CAPTCHA[1] codes (numerals or characters/pictures) are required to access RoRs/CMs as reported in 12 States/UTs (see Figure 8.5). Except in the case of Kerala, the copies of land records were available free of cost for users in all the States/UTs.

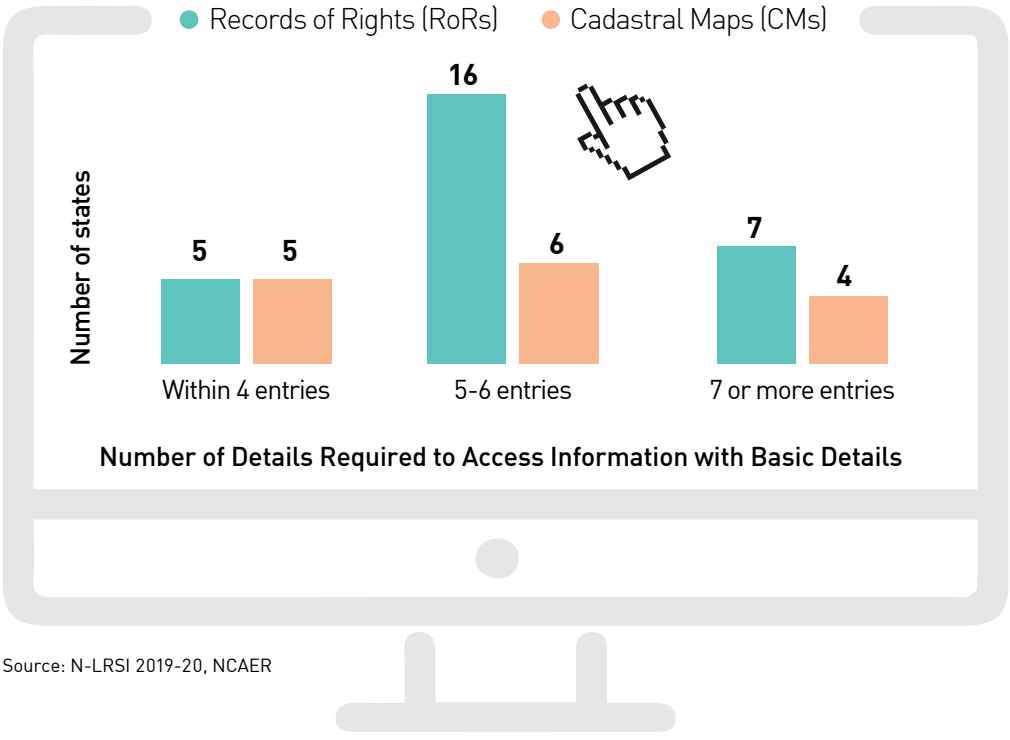
For details, please refer to Annexure Table A8.1.

8.2.2. Stage-wise Analysis of Access of RoRs and CMs across States/UTs

This section summarises the step-wise accessibility barriers faced during the dipstick test-checks for RoRs/CMs.

Accessing RORs: When the State/UT portals were visited, the RoRs were found

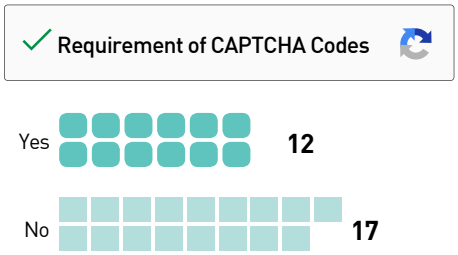
Figure 8.4: Distribution of States/UTs: User Interface (No of entries requirement with basic details)



Source: N-LRSI 2019-20, NCAER

1 "Completely Automated Public Turing test to tell Computers and Humans Apart" (After Alan Turing, 1950).

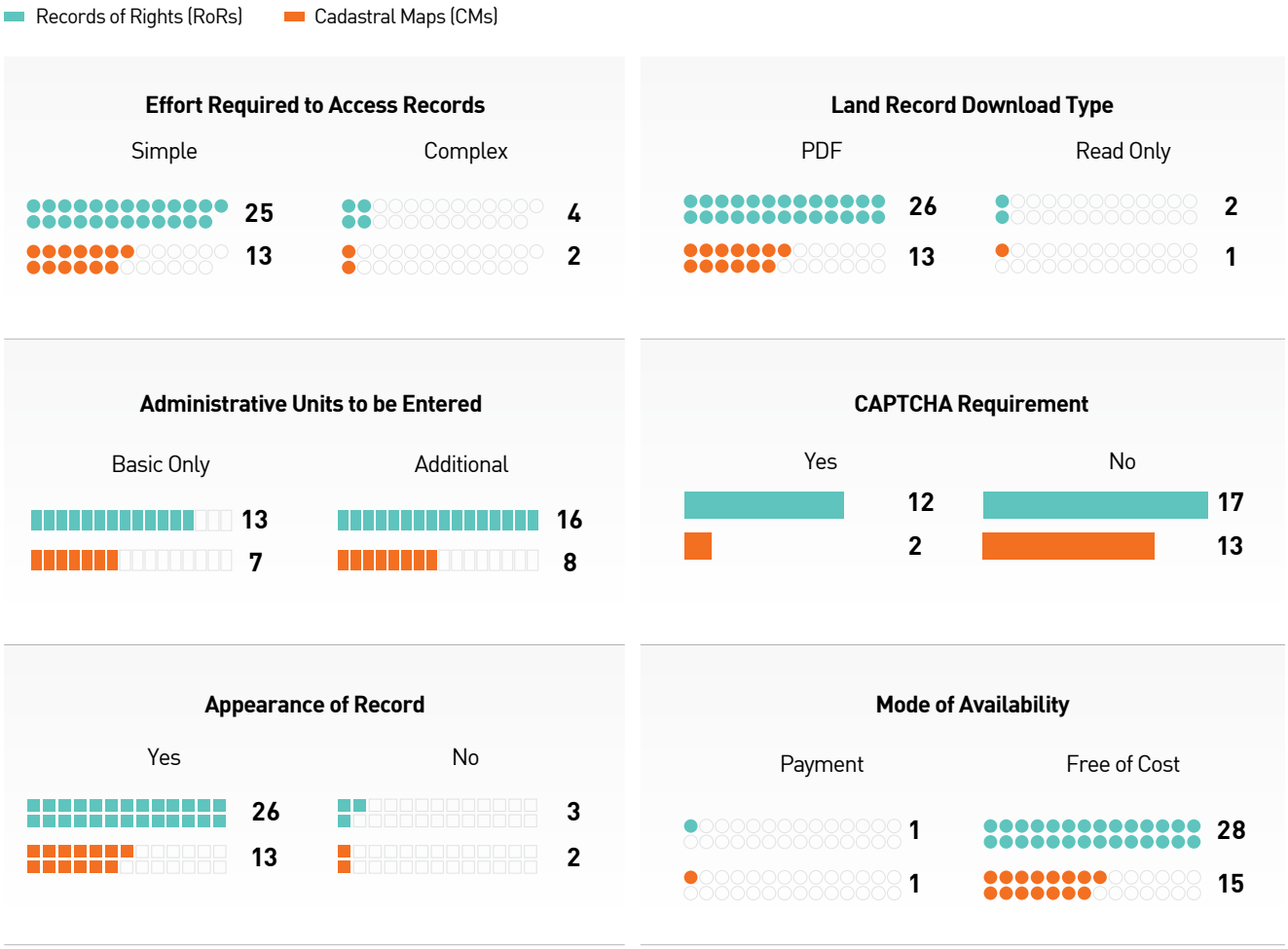
Figure 8.5: Distribution of States/UTs: User Interface (Requirement of CAPTCHA Codes)



Source: N-LRSI 2019-20, NCAER

to be easily accessible in the case of 25 States/UTs, as illustrated in Figure 8.6. For accessing the documents, in addition to the identifier and three basic administrative details, 16 States/UTs also require the user to fill other details such as the year, khata type, and sub-division number, among others, to access the RoR. However, in a majority of the States/UTs, the RoRs were easily exhibited on the website on-screen after the above details were entered. In addition to this, 12 States/UTs required

Figure 8.6: Distribution of States/UTs on Ease of Accessing RORs and CMs



Note: Out of 31 States/UTs reporting digitisation of RORs, three States/UTs either do not have portals or these are inaccessible.
Source: N-LRSI 2019-20, NCAER

Box 8.2: Illustrations of Accessibility Issues Faced during the Test-Checks

1. The State of Rajasthan reported the following issues: i) One of the *tehsils*, 'Baitu', was being counted in Bharatpur district by the DoLR website, whereas in reality, this *tehsil* belongs to Barmer district; ii) In Bhilwara district, the sample villages as recorded in the Sahara *tehsil* were found in Raipura *tehsil* of the same district; iii) In the case of CMs, a few *tehsils* were not found in the drop-down menu; iv) A few villages were found on the portals only after several attempts as another village name automatically got selected instead of the requested village; v) In a few cases, the record identifier column/cell did not appear, vi) Even after all the necessary information was provided, a few RoRs were opening as blank documents showing technical error messages.

2. In Gujarat, in the case of RoRs, sample villages in the Devabhumi Dwarka district (drawn from the DoLR database) were not found in the relevant *tehsil.*

3. In Tamil Nadu, the drop-down menu for the patta number was not available, and hence the only method to obtain it was through trial and error by typing random patta numbers Moreover, the range of patta numbers varied a lot within *tehsils*.

4. In Assam, 21 villages in Majuli *tehsil* in Majuli district were not found in the respective *tehsil* but were identified in Jorhat *tehsil*. Hence, all 12 sample villages were replaced in the Majuli *tehsil* and a new sample was drawn. Another issue reported was that Bijni *tehsil* was found in Chirang district instead of in Bongaigaon district, as provided in the DoLR database. Moreover, there was no range available for the dag number on the portal.

5. In many cases, the listing of revenue villages did not have a unique corresponding record in the portals of the States/UTs. Cases of Group Gram Panchayats in which more than one revenue village formed a part of the panchayat, were commonly observed in Bihar and Jharkhand. This made the search for land records infructuous.

6. Due to administrative changes, district names had changed in some cases. At some places, the district name that had changed was not necessarily accompanied with the change in the *sadar/tehsil* of the same name. For example in Punjab, the change in the name of Ropar to Roopnagar was not done on the State portal. A number of administrative changes had either re-organised the tehsils in full or in part from one district to the new one. For example, in Uttar Pradesh, Amethi *tehsil* had been re-organised into Sultanpur.

7. In Himachal Pradesh, it was reported that the sample villages in Bhadrota *tehsil,* as taken from the DoLR website, were found in Balichowki *tehsil* on the State portal. In addition, the Neermand *tehsil* was not accessible despite multiple attempts to locate it.

8. Uttarakhand reported multiple issues of *tehsils* not being found on the State portal but the sample villages in those *tehsils* were found in another *tehsil*. Following are some examples of such cases: villages of Pulla Gumdesh found in Loha Ghat, village of Munch *tehsil* in Champawat *tehsil,* villages of Dewal *tehsil* in Therari *tehsil,* Jalali *tehsil* in Dwarhat, Shama *tehsil* in Kapkot, villages of Narsan *tehsil* found in Roorkee *tehsil*, and so on.

9. In Jharkhand, Barhait *tehsil* in Sahibganj district was not found on the State portal.

10. In Madhya Pradesh, Newari district, which had been recently formed in 2018 from Tikamgarh district, was not found on the State portal.

11. In Tamil Nadu, Chennai district was still being considered as rural on the DoLR website but the sample for the same could not be drawn since Chennai has now been considered as urban.

the user to enter CAPTCHA codes. As regards payment for accessing the RoRs, except for Kerala, in all the other cases, information was available free of cost. When all the above requirements were fulfilled, the RoRs were downloadable in PDF formats in 26 States/UTs, whereas in two States/UTs, the RoRs appeared on-screen in read-only format, while in Kerala they could not be accessed at all.

Accessing CMs: When the portals of the States/UTs were visited, the type of details required or the procedure to access the CMs was found to be simple in 13 States/UTs, but in eight States/UTs, additional information was required to gain access, such as the Revenue unit number, and map type, apart from the basic administrative details and identifier number (see Figure 8.6). After the above details were entered, the CMs easily appeared on the web screen in 13 States/UTs and in almost 13 States/UTs, PDF versions of the CMs were downloadable. In a majority of the States/UTs, CAPTCHA codes were not required, and except for Kerala, maps were available free of cost in case of all States/UTs.

(For details, please refer to Annexure Tables A8.2 and A8.3).

The specific State/UT-wise examples of accessibility issues have been summarised in Box 8.2

8.3. Measurement of Citizens' Use and Satisfaction with the Interface and Services: Proposed Primary Survey

Although the current N-LRSI, based on information reported by the States/UTs and test-checks is an excellent start, it is a good reflection mainly of the supply-side of land record services. While NCAER will continue to refine this supply-side picture of the N-LRSI in Year 2 and beyond, it is important to incorporate user perceptions of land record services and how they relate to peoples' perceptions of their property rights in practice. This will more credibly capture both the demand- and the supply-side dimensions of land record-related services in each State/UT, and thereby spur individual States/UTs to improve their respective standings in the N-LRSI rankings. This is vital for obtaining an independent check of how the governments' initiatives are translating on the ground to citizens' experiences. The same considerations have prompted recent analytical work, including at NCAER, which seeks to look at the impact of the Government's reforms on the ease of doing business and their impact on the ground.

In a larger sense, the 'user perceptions' part of the LRSI will be used to validate actions taken by the States/UTs on the supply side. The N-LRSI with both supply and demand indicators, if linked to financial (and political) rewards and sanctions, can promote the race to the top, which is needed for achieving efficient and large-scale modernisation of India's land records. This approach fits in well with India's emphasis on competitive and co-operative federalism, and could prove to be a significant step towards achieving the goal of effective land record management. The 'user perceptions' component of the LRSI is vital for measuring demand-side satisfaction and whether changes in official policy, programmes, and practice are creating a perceptible difference on the ground.

8.4. Conclusion

This chapter examined the accessibility

Despite the fact that land records and circle rates are digitised, considerable accessibility issues remains at each stage

issues faced by users in downloading/accessing RoRs, CMs, and circle rates from the State/UT portals. This study found that despite the fact that land records and circle rates are digitised, there are considerable accessibility issues at each stage, such as ease of access to a server, changes in administrative units, and mismatch of names/spellings, multiple attempts being needed for accessing and downloading records, language and translation issues, and other user interface problems (for a comparative assessment of N-LRSI accessibility issues and NeSDA framework, refer to Box 8.3).

In a significant proportion of the States/UTs, there is also a need to enter additional information apart from basic administrative details and identifier numbers for accessing the data. Translation of on-site matter was offered in the websites of very few States/UTs, and as many as 25 States/UTs reported non-availability

Box 8.3: N-LRSI 2019-20 Accessibility Issues versus NeSDA Framework 2019

NeSDA 2019 was an exercise that aimed to analyse the mechanism adopted to improve service delivery at the level of the States/UTs /Central Ministries. The N-LRSI 2019-20 inter alia looked at the accessibility issues in relation to land records and the registration process.

The NeSDA framework covers G2C and G2B segments (especially small businesses), in six identified sectors, viz., the Finance, Labour and Employment, Education, Local Government and Utilities, Social Welfare (including Agriculture and Health) and Environment (including Fire) sectors. The Record of Rights (RoRs) has been covered under the 'Finance' sector. The NeSDA framework primarily assessed all the service portals (State/UT and Central Ministry service portals) on seven key parameters, viz. Accessibility, Content Availability, Ease of Use, Information Security and Privacy, End-service Delivery, Integrated Service Delivery and Status and Request Tracking. Apart from the service portals, the quality of the State/UT portals was also assessed on four parameters: Accessibility, Content Availability, Ease of Use, and Information Security and Privacy.

Major Findings: The NeSDA reports that Record of Rights (RoRs) scores the lowest position in the list of the most availed of e-services in the Finance sector. There is no further segregated state-wise data on RoRs.

NCAER's N-LRSI framework covered land records including RoRs, Cadastral Maps (CMs) and five stages of the registration process. The N-LRSI both test-checked data available on the web portals and obtained information from knowledge persons. The test-check process has been analysed on four parameters: access to the server and records, time taken for accessing records, language and simplicity, and user-interface issues.

Major Findings: N-LRSI reports that despite the fact that land records and circle rates have been digitised, there are considerable accessibility issues at each stage, such as ease of access to server, changes in administrative units and mismatch of names/spellings, multiple attempts required for accessing and downloading records, language and translation issues, and other user interface problems. In a sense, these observations provide some support to the NeSDA finding of a relatively lower incidence of services related to RoR being availed of.

Source: N-LRSI 2019-20 and National e-Governance Services Delivery Assessment (NeSDA) 2019.

of a separate tab for 'Help/Frequently Asked Questions (FAQs)' on their portals to help the users. Despite these issues, a positive finding is that except for Kerala, in almost all the States/UTs, information on land records was available free of cost. In a majority of the cases, it was reported that downloadable copies of RoRs/CMs were also available without need for any identification proof. In terms of the time taken for downloading the records, a majority of the State/UT portals took less than a minute, though this was after the process of locating the right portal and record (as mentioned above). The redressal of accessibility problems can easily help in making the digitisation of land records programme more successful and simpler for citizens.

CHAPTER

9

INFERENCES AND PROSPECTS

9.1 Inferences

1. Records for different types of lands

An exercise of the scale and type required for formulating the N-LRSI, made it imperative to obtain data on a host of issues from each of the States and UTs. Apart from the primary checks done as part of this study, on at least two aspects, data does not appear to have been collated at one place before. The first dimension that the Index attempted to measure was the extent to which the land area of all States/UTs' has a ground survey-based land record. It was difficult to obtain an exact answer to this question from most States /UTs. Comprehensive data was available only from 21 States/UTs. Hence, another route had to be found to compute the proportion of area with land records in each State/ UT. This involved collecting data on different types of land areas for which States / UTs may or may not have land records, primarily forests and urban area. Broadly three types of situation exist:

i) Forest lands invariably do not possess a cadastre-based land record. There are valid reasons for seeking a land record for areas where local inhabitants have rights that need to be recorded under the Forest Rights Act (2006)[8]. However, in order to assess all States/UTs on a uniform basis, the area under forests was not included in working out the proportion of area with land records.

ii) The second land use category that sometimes lacks a survey based record, is the area classified as urban by States/UTs (discussed in more detail below).

iii) Finally, there are States/UTs that almost completely lack a survey based land record.

Since comprehensive secondary data was not readily available for records pertaining to different types of lands, data was collected/verified through KCs for each State/UT. This data has been pieced together to yield an estimate of the proportion of areas with land records in India's States and UTs.

2. Urban land records

It is well-known that urban areas (and the fringes of urban areas) have a relatively higher intensity of property transactions. In the absence of clear land records, these areas are more likely to be the sites of property-related disputes. This in turn imposes higher transaction costs on the economy apart from being a constraint for the development of infrastructure and housing. It also raises problems in adequately compensating agrarian land-owners whose properties may be acquired or purchased. States / UTs have been grouped into three categories depending on the nature of their urban land / property record. Each has a different set of challenges in becoming a more comprehensive, up-to-date record

i) The more advanced States/UTs that have a separate survey-based property record still face the problem of recording the details of ownership in vertically built up property e.g. multi-storeyed apartment buildings.

ii) States/UTs with urban land records similar to those in rural areas have less accurate cadastre-based maps with an added problem of not maintaining an

The more advanced States/UTs that have a separate survey-based property record still face the problem of recording the details of ownership in vertically built up property e.g. multi-storeyed apartment buildings

8 The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, recognizes in addition to individual rights of tribal and other communities to cultivated land in forest lands, rights of communities over common property resources. It restores rights "in and over disputed land Rights of settlement and conversion of all forest villages, old habitation, un-surveyed villages and other villages in forests into revenue villages." The notification of Rules for the implementation of the Forest Rights Act, 2006 was issued on 1st Jan 2008.

Source: https://www.fra.org.in/ (accessed on Dec 01 2019)

The fact that comparatively digitisation of the textual record has made the most progress, was perhaps expected and borne out by this exercise

exact record of even built-up spaces and their dimensions. They also lack records in relation to vertical spaces.

iii) Finally States/UTs with only property tax based urban records do not have any land area details since in these cases no surveys have ever been conducted. Such records have a less legal credence for proving title although they may suffice for municipal tax collections.

3. Integrity and reliability of data-sources for land records

In order to be able to answer the question: what is the extent of digitisation of the land records and registration process in India's States / UTs, the only existing comprehensive data base is the DoLR website. However, this data is as reported by the States / UTs themselves and it does not undergo any process of authentication by a third party. It is for the first time that such an authentication has been attempted in building this Index. It has enabled uncovering both over and under reporting, errors in entering data as well as differences in understanding what computerisation of records and processes may mean. There are States / UTs that have reported digitisation but not made the concerned data available for viewing on the web. There are also cases where the terms used to classify the data entered have an entirely different meaning in different States / UTs. This exercise has not only enabled authenticating the achievements of the States / UTs but also has added value by drawing attention to improving the quality of reporting and the need for standardising different terms and processes such as "integration" of land records and registration, "instant mutation" and computerisation of registration. The variation between the reports on the DoLR website and what the States / UTs have actually achieved is, at the basic level, a case of incorrect entries as well as under or over-reporting. At another level, it represents the lack of a central platform that can retrieve data from the States / UTs' portals on a real-time basis, and ensure that these discrepancies do not pose a barrier to obtaining a clear picture of the performance of States / UTs.

4. Relative emphasis on digitising land records and the registration process

In analysing the extent of digitisation, this exercise has attested to a number of facts that were already known. At the same time, it has highlighted and brought out facts that quite often end up not being acknowledged. Thus the fact, that comparatively digitisation of the textual record has made the most progress, was perhaps expected and borne out by this exercise. Prioritising of fresh surveys to secure a more accurate record of the situation on-ground. The fact that this required first, a digitisation of the existing 'inaccurate' spatial records, was perhaps realized only somewhat later. The realisation that this is a first step even if a fresh survey is contemplated was accompanied both by improvements in the ability to scan and vectorise the old paper records as well as in GoI de-emphasizing fresh, surveys. The relatively lesser importance accorded to digitising the registration process under the earlier NLRMP (with a 75% matching requirement from States/UTs), may have accounted for the lack of progress in this sphere. However, the State/UT-wise variations in the attention paid to digitising the different aspects of land records and registration, show that States / UTs have often chosen their own path in these matters, regardless of the priorities and funding provided by the national programme.

Many of the States leading in the digitisation of land records according to the DoLR website, fared relatively poorly in the test-checks conducted as part of this exercise. The reasons were not necessarily mis-reporting of achievement. It was often a lack of adherence to quality checks in making available the records on the web. The records were many a time, wrongly classified are not in a position to be retrieved from the web. There were also instances of server access posing a nearly insurmountable barrier to accessing the records. Overall, the extent of RoR digitisation came in at 86.3 % in 28 States/ UTs while that of the CMs lagged at 78.3 % in only 14 States/UTs. There is hence some effort required to correcting these lapses apart from the attention required to improve the quality of access.

This deficiency of actual service was witnessed even more acutely in another respect. As many as 10 States / UTs make available legally usable copies of the textual records only from government offices thus enormously reducing the real access to citizen users in terms of both choice of location and timing. Only 3 States and UTs were found to be making legally usable copies of CMs available on the web.

5. Performance of States/UTs in registration

States / UTs straddle a wide spectrum in their approach to digitising the registration process. A few States / UTs have made exemplary progress in digitising various stages of the registration process in order to reduce both the time that clients must spend on the process of registration, and limiting the extent of discretion exercised by the government functionaries charged with this function. At the other end, many are yet to make a start. Most States/UTs however, are in varying stages of adopting digitisation. Overall the States / UTs averaged an achievement of 7.9 points on the maximum 20 points set aside for this component of the index showing considerable leeway that needs to be made up. They recently made available national generic software for registration, may fasten the process.

6. Congruence of records to the on-ground situation

Most States/UTs have some ground to cover before achieving the objective of creating a comprehensive record that accurately reflects the on-ground situation. This exercise revealed that no State/UT has yet been able to ensure that a registered property transaction can have a mutation attested on the same day. Gujarat had come close to achieving this but a stay has been obtained against this, in the Gujarat High Court. Only 7 States / UTs have linked the two platforms of registration and land records with each other so as to have a "note" appear in the textual record as soon as a transaction relating to property is registered.

Finding ways to use technology to update the records in the case of inheritance, is still to be attempted in any State / UT. Recording possession accurately does not appear to be a matter of concern at all in any States/UTs. In many instances, there is no provision for even recording possession as distinct from ownership. Even where it is possible, statutory provisions apparently favouring tenants on agricultural land, have the effect of leaving such arrangements largely unrecorded. Finding ways to create some security in contract-farming relationships is exercising attention in some States / UTs but the idea of recording such arrangements remains to be addressed. The failure to think of creating a record of tenancy at least in built-up property has

Finding ways to use technology to update the records in the case of inheritance, is still to be attempted in any State / UT

Real-time attestation of mutations is needed for property-related transaction once registered

also not been deemed of importance till now.

On land use, the existing systems in almost every State and UT, still require revenue officers to only record agricultural land type and the crop sown. The fact that built-up property has far more value, is more likely to be transacted and therefore, benefit most from an accurate record of dimensions, is yet to find resonance amongst the States and UTs. The importance of creating an accurate record of built-up spaces (in both urban and rural), has only recently received recognition in some States / UTs.

On the question of restrictions and conditions attached to landed property, some States/UTs do not record any kind of encumbrance in the RoR. Many States / UTs profess to record more than just mortgages but the extent to which these do find their way into the record, has not been easily verifiable. Overall, it is perhaps not unfair to conclude that the realisation of the urgent need to record encumbrances fully to reflect the on-ground situation (ideally, recording changes as they occur on real-time basis), and thereby to minimise disputes, is incipient amongst most States /UTs.

7. Institutionalised priority to improving land records management

The approach to digitising land records and the registration process in various States/UTs, appears to have been guided by a number of factors. States / UTs otherwise known for being better on governance parameters are not necessarily amongst the best in the rankings according to this Index (apart from Maharashtra and Tamil Nadu). States like Madhya Pradesh, Chhattisgarh, Odisha and Uttar Pradesh that are not generally considered the best in terms of governance, rank amongst the highest on the N-LRSI. It appears that in many States/UTs, initiatives made by individuals / teams who were a position to influence policy decisions and implementation, played key roles in propelling the efforts made. This probably confirms that institutionalised priority to improving land and property records at the State/UT level, is yet to find an exemplar.

9.2 Prospects

1. The N-LRSI results point out areas of possible improvement in performance: what are the tasks that no State/UT has addressed at all? Some of these are alluded to in the preceding paragraphs but there are more!

i) Real-time attestation of mutations is needed for property-related transaction once registered.

ii) Other possibilities in a long list include linking databases like birth and death registers and genealogical tables (attached to RoRs in some States/UTs) in order to bring the requirement for inheritance related mutations into real-time notice.

iii) The issue of recording tenant-possession of rented built-up properties needs to be addressed.

iv) Map approvals need to be linked to land records so that the latter reflect changes in land use as well as the extent of proposed built up properties.

v) The data bases such as the Official Gazettes that record the start of land acquisition proceedings or the introduction of town planning related land use, need to be linked to

the land records data base.

vi) There are also areas where some States/UTs have performed really well and can be easily copied by other States / UTs. On a technical note, the most obvious and easily adopted action is to follow States / UTs that have more easily navigable websites and up-to-date portals to assist clients. More quality checks of data that have been made available to see that information is located in the right places are called for in many States / UTs.

vii) States / UTs that have digitised records and are yet to make these available on the web, just need to do this!

viii) The digitisation of various stages in the registration process has been rendered easy by the generic software developed by NIC. States / UTs need to customise and follow these quickly. Vanguard States/ UTs also need to consider bringing in virtual registration as pioneered by Maharashtra. The linkage between RoRs and registration data bases to generate a note in the textual records on the registration of a property transaction is an action that all States / UTs can adopt quite easily. Recording all ownership in built up vertical spaces, like apartment blocks, as is being attempted in Maharashtra, is another act worth following for all States / UTs. Linking records of cooperative societies or drawing on municipal property tax records can make this task easier.

ix) States / UTs also need to consider ways to quickly survey unmapped inhabited areas and create a record for these areas. Maharashtra's pilots with drone surveys are one example to learn from in this matter. There are also possibilities of using LIDAR where economies of scale make this practical.

x) States / UTs need to hasten the process of digitising the spatial record and giving the area actually recorded in digitised CMs legal legitimacy where it shows greater congruence with the on-ground situation than the area noted in the RoR. Some States and UTs appear to have made progress in linking institution of court cases with the textual record. These actions are surely worth emulating by others at an early date.

xi) For the Government of India, the N-LRSI offers a great opportunity in a number of directions. At the minimum it can seek a qualitatively better attempt at updating information on the DoLR websites by States / UTs. The States/UTs can be requested to make updating a real-time exercise by standardising links to relevant data bases. States/ UTs can also be requested to carry out more quality-checks of their records. Most important, the GoI can explore approaches to rewarding and recognising States / UTs that perform better on this Index so that the others are incentivised to improve and race beyond the front runners.

9.3 N-LRSI 2019-20 and Beyond

The first round (2019-20) of construction of the N-LRSI has primarily used supply-

At the minimum, GoI can seek a qualitatively better attempt at updating information on the DoLR websites by States / UTs

side data (and proxies for measuring preliminary citizens' access) for assessing the extent of digitisation and gauge the quality of land-records' related services offered. For the second round (N-LRSI 2020-21), a demand-side survey of citizens is proposed to be added.

The survey will be used to gauge the level of public awareness and appreciation of the digitisation process, and the services it has enabled as elicited by a primary survey of users. The 2019-20 exercise has enabled drawing attention to the nature of steps that are easily possible for States and UTs to assist in the creation of a more comprehensive, accurate record of the situation on-ground, and that can be updated in real time. Some of the steps mentioned above can be easily implemented by States/UTs in a short period of time. Depending on the progress made, the components of the Index could be assigned different weights in the subsequent rounds. This will ensure a forward-looking aspirational focus to the Index, that spurs States/UTs to improve their performance individually and hence, as a country as a whole. The Index is timely and now poised to attract the attention of the relevant stakeholders. Were it to gain traction from GoI, States/UTs and citizens at large, the Index promises to become a bellwhether of improved land governance in India.

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ANNEXURES

Table AI: Terms used for Textual Land Records across States/UTs

	States	Official Term for RoR	Official Term for RoR
1	Andaman & Nicobar	Form F	Form F called patta or khatuni slip locally
2	Andhra Pradesh	1 B	Adangal copy
3	Assam	Jamabandi	Jamabandi
4	Bihar	Adhikar Abilekh	Khatian and Jamabandi
5	Chhattisgarh	Form B1	Khasra
6	Chandigarh	Jamabandi	Jamabandi
7	Dadra & Nagar Haveli	Sat Bara (7-12)	Sat Bara (7-12)
8	Daman & Diu	I - XIV	I - XIV
9	Goa	I - XIV	I - XIV
10	Gujarat	Village Form 7	Sat Bara (7-12)
11	Haryana	Jamabandi	Jamabandi
12	Himachal Pradesh	Jamabandi	Jamabandi
13	Jammu & Kashmir	Jamabandi	Jamabandi
14	Jharkhand	Adhikar Abilekh	Khatian
15	Karnataka	RTC Form No. 16	Pahani
16	Kerala	Thandaper	Thandaper – the extract is Thandaper pakarpp
17	Ladakh	Jamabandi	Jamabandi
18	Lakshadweep	Land Register	Land Register
19	Madhya Pradesh	Form B-1	Khatauni / khasra
20	Maharashtra	Sat Bara (7-12)	Sat Bara (7-12)
21	Manipur	Jamabandi	Jamabandi / patta
22	Delhi	Form P-6A (Khatauni)	Jamabandi / Khatauni
23	Odisha	Khatian	Khatian
24	Puducherry	Settlement Register	Chitta/Patta
25	Punjab	Jamabandi	Jamabandi
26	Rajasthan	Jamabandi	Jamabandi
27	Sikkim	Parcha	Parcha
28	Tamil Nadu	Chitta	Chitta is extract of Patta register supplemented by adangal
29	Telangana	RoR 1B	Copy of Patta Register & Pahani
30	Tripura	Form 1	Khatiyan
31	Uttarakhand	Account Statement	Khatauni
32	Uttar Pradesh	Khata Vivran	Khatauni
33	West Bengal	Khatian	Khatian

Note: * This document need not always be the RoR; **Source:** N-LRSI 2019-20, NCAER

Table AII: Terms used for Circle Rates across States/UTs

	States	Terms Used
1	Andhra Pradesh	Unit Rates
2	Bihar	Minimum Value register (MVR)
3	Chhattisgarh	Market price rate guideline
4	Goa	Minimum Land Rates
5	Gujarat	Jantri Rates
6	Haryana	Collector Rates
7	Himachal Pradesh	Circle rates
8	Jammu & Kashmir	Land Rates
9	Jharkhand	Minimum Value of Land (Valuation)
10	Karnataka	Market Value
11	Kerala	Fair Value of Land
12	Madhya Pradesh	Guideline value
13	Maharashtra	Ready Reckoner rates
14	Odisha	Benchmark Valuation (BMV)
15	Puducherry	Guideline Register Value
16	Punjab	Collector Rates
17	Rajasthan	District Level Committee Rates (DLC)
18	Sikkim	Block Rates
19	Tamil Nadu	Guideline Value
20	Telangana	Unit rate
21	Uttar Pradesh	Evaluation List
22	Uttarakhand	Circle rates
23	West Bengal	Market value of land

Source: N-LRSI 2019-20, NCAER

Table AIII: Textual Record Portal Details

	States	Land Records Portal: Status
1	Andhra Pradesh	https://meebhoomi.ap.gov.in/
2	Andaman & Nicobar	http://db.and.nic.in/ROR/view1/formf.aspx
3	Arunachal Pradesh	Not Available
4	Assam	http://revenueassam.nic.in/dhar/index.php/Welcome/SelectLOC
5	Bihar	http://lrc.bih.nic.in/
6	Chandigarh	Not Available
7	Chhattisgarh	https://bhuiyan.cg.nic.in/
8	Dadra &Nagar Haveli	http://117.202.16.169/avanika/Print712common1.aspx
9	Daman & Diu	http://dd.nlrmp.in/lrc/form114.aspx
10	Goa	https://egov.goa.nic.in/dslr/f114new.aspx
11	Gujarat	https://anyror.gujarat.gov.in/Info712Page.aspx
12	Haryana	https://jamabandi.nic.in/
13	Himachal Pradesh	http://lrc.hp.nic.in/lrc/Revenue/viewlandrecords.aspx
14	Jammu & Kashmir	Not Available
15	Jharkhand	https://jharbhoomi.nic.in/jhrlrmsmis/
16	Karnataka	https://landrecords.karnataka.gov.in/rtconline/
17	Kerala	Accessibility Issue (http://erekha.kerala.gov.in/newsurvey.php)
18	Ladakh	Not Available
19	Lakshadweep	https://land.utl.gov.in/Process/Login-Page
20	Madhya Pradesh	http://landrecords.mp.gov.in/
21	Maharashtra	https://bhulekh.mahabhumi.gov.in/
22	Manipur	https://louchapathap.nic.in/MIS/frmROR45
23	Meghalaya	Not Available
24	Mizoram	Not Available
25	Nagaland	Not Available
26	Delhi	https://dlrc.delhigovt.nic.in/
27	Odisha	http://bhulekh.ori.nic.in/RoRView.aspx
28	Puducherry	http://www.pon.nic.in/nilamagal/
29	Punjab	http://jamabandi.punjab.gov.in/
30	Rajasthan	http://apnakhata.raj.nic.in/LRCLogin.aspx
31	Sikkim	Not Available
32	Tamil Nadu	https://eservices.tn.gov.in/eservicesnew/land/chitta.html?lan=en
33	Telangana	http://ccla.telangana.gov.in/integratedLandRegistry.do
34	Tripura	https://jami.tripura.gov.in/Citizen_Service/citiz_ror.aspx
35	Uttarakhand	http://bhulekh.uk.gov.in/public/public_ror/Public_ROR.jsp
36	Uttar Pradesh	http://upbhulekh.gov.in/public/public_ror/Public_ROR.jsp
37	West Bengal	http://www.banglarbhumi.gov.in/

Source: N-LRSI 2019-20, NCAER

Table AIV: Spatial Record Portal Details

	States	Land Records Portal: Status	Remarks
1	Andhra Pradesh	https://bhunaksha.ap.gov.in/bhunaksha/28/indexmain.jsp	
2	Andaman & Nicobar	Not Available	
3	Arunachal Pradesh	Not Available	
4	Assam	http://revenueassam.nic.in/bhunakshag2c/	Accessibility Issue
5	Bihar	http://bhunaksha.bih.nic.in/bhunaksha/	
6	Chandigarh	Not Available	
7	Chhattisgarh	https://bhunaksha.cg.nic.in/	
8	Dadra &Nagar Haveli	Not Available	
9	Daman & Diu	Not Available	
10	Goa	Not Available	
11	Gujarat	https://revenuedepartment.gujarat.gov.in/village-map	Not amenable to a plot wise search
12	Haryana	https://hsac.org.in/eodb/	The State's Revenue Department has not recognized these digitized CMs
13	Himachal Pradesh	https://bhunakshahp.nic.in/	
14	Jammu & Kashmir	Not Available	
15	Jharkhand	https://jharbhunaksha.nic.in/	
16	Karnataka	https://www.landrecords.karnataka.gov.in/service3/	Not amenable to a plot wise search
17	Kerala	http://erekha.kerala.gov.in/newsurvey.php	Payment required for obtaining copies
18	Ladakh	Not Available	
19	Lakshadweep	http://bhunaksha.utl.gov.in/	
20	Madhya Pradesh	http://www.mpbhuabhilekh.nic.in/bhunaksha/	
21	Maharashtra	https://mahabhunakasha.mahabhumi.gov.in/27/index.jsp	
22	Manipur	Not Available	
23	Meghalaya	Not Available	
24	Mizoram	Not Available	
25	Nagaland	Not Available	
26	Delhi	http://gsdl.org.in/revenue/index.aspx	
27	Odisha	http://bhunakshaodisha.nic.in/	
28	Puducherry	Not Available	
29	Punjab	http://jamabandi.punjab.gov.in/CadastralMap.aspx	Not amenable to a plot wise search
30	Rajasthan	http://bhunaksha.raj.nic.in/bhunaksha/	
31	Sikkim	Not Available	
32	Tamil Nadu	https://eservices.tn.gov.in/eservicesnew/land/chitta.html?lan=en	
33	Telangana	https://ilrms.telangana.gov.in/gis/	
34	Tripura	https://jami.tripura.gov.in/Citizen_Service/map_view.aspx	Not amenable to a plot wise search
35	Uttarakhand	Not Available	
36	Uttar Pradesh	http://upbhunaksha.gov.in/bhunaksha/09/index.html	
37	West Bengal	http://www.banglarbhumi.gov.in/	

Source: N-LRSI 2019-20, NCAER

Table A1.1: Physical Progress of States/UTs under DILRMP in Various Components

S. No.	State/ UTs	% of Villages			Percentage of Digitised SRO%	Integration of Registration with LR%
		Digitised RORs	Digitised CMs	CMs link ROR%		
1	Andaman & Nicobar Islands	99.5	13	43.9	100.0	20.0
2	Andhra Pradesh	97.2	56.6	1.9	100.0	100.0
3	Arunachal Pradesh	0	0	0	0.0	0.0
4	Assam	58	90.4	54.6	93.3	89.3
5	Bihar	65.3	99.7	0.1	96.8	7.1
6	Chandigarh	37.5	0	0	100.0	0.0
7	Chhattisgarh	85.3	91	91.2	3.1	2.1
8	Dadra & Nagar Haveli	100	100	4.2	100.0	100.0
9	Daman & Diu	78.6	0	0	50.0	0.0
10	Goa	99.8	100	99.8	100.0	100.0
11	Gujarat	96.4	12.6	24.4	100.0	100.0
12	Haryana	92.9	91.8	0	100.0	100.0
13	Himachal Pradesh	98.8	99.8	39.9	71.9	71.9
14	Jammu & Kashmir	9.3	0	0	0.0	0.0
15	Jharkhand	99.1	87.8	65.3	100.0	100.0
16	Karnataka	99.6	0	0	0.0	0.0
17	Kerala	43.2	94.5	0	100.0	99.4
18	Ladakh	6.7	0	0	0.0	0.0
19	Lakshadweep	100	0	0	0.0	0.0
20	Madhya Pradesh	99.2	97.8	86.8	100.0	95.3
21	Maharashtra	98.8	5.7	3.6	98.8	98.8
22	Manipur	15.6	100	0	5.6	0.0
23	Meghalaya	0	0	0	9.1	0.0
24	Mizoram	24.9	100	29.6	0.0	0.0
25	Nagaland	32	100	32.1	0.0	0.0
26	NCT Of Delhi	94.7	100	32.4	100.0	100.0
27	Odisha	100	100	99.9	100.0	100.0
28	Puducherry	90	100	0	100.0	0.0
29	Punjab	93.6	90.9	0	94.2	5.8
30	Rajasthan	96.8	15.1	0.3	98.7	98.7
31	Sikkim	100	100	0	94.1	94.1
32	Tamil Nadu	99.8	98.1	10.9	82.0	5.4
33	Telangana	99.4	86.5	0.8	100.0	100.0
34	Tripura	99.9	100	99.8	91.3	91.3
35	Uttarakhand	94.4	15.3	13.3	90.4	9.3
36	Uttar Pradesh	96.2	30.6	7	90.7	36.9
37	West Bengal	98.1	93.1	92.4	100.0	90.6
	All India	**90.2**	**53.3**	**33.8**	**84.3**	**64.9**

Source: DoLR as accessed on December 2019

Table A1.2: Status of Funds Sanctioned, Released and Expenditure Incurred (in Rs crores)

S. No.	State/ UTs	Funds Sanctioned by Centre	Funds Released by Centre	Expenditure (as entered by State/UT)
1	Andaman & Nicobar Islands	3.48	1.72	0
2	Andhra Pradesh	65.24	65.24	0
3	Arunachal Pradesh	20.93	12.07	0
4	Assam	44.32	36.6	0
5	Bihar	160.19	77.71	0.01
6	Chandigarh	4.33	0.7	0
7	Chhattisgarh	95.09	33.46	11.58
8	Dadra & Nagar Haveli	0.45	0.34	0
9	Daman & Diu	1.38	1.04	0.2
10	Goa	6.64	3.99	0
11	Gujarat	184.14	142.97	1.32
12	Haryana	61.88	41.37	6.81
13	Himachal Pradesh	69.28	43.44	11.9
14	Jammu & Kashmir	17	10.19	0
15	Jharkhand	41.79	37.58	1.18
16	Karnataka	40.59	24.51	0
17	Kerala	40.9	28.07	3.75
18	Ladakh	0	0	0
19	Lakshadweep	2.22	2.16	0
20	Madhya Pradesh	137.53	83.24	0.32
21	Maharashtra	104.32	65.35	0.58
22	Manipur	2.25	1.69	1.69
23	Meghalaya	8.32	6.24	0
24	Mizoram	26.82	19.11	0
25	Nagaland	17.16	15.48	1.65
26	NCT Of Delhi	3.09	1.32	0
27	Odisha	151.7	96.25	26.56
28	Puducherry	4.99	4.98	0
29	Punjab	42.97	27.97	2.14
30	Rajasthan	193.19	41.37	0
31	Sikkim	13.69	12.77	3.55
32	Tamil Nadu	47.98	32.1	19.34
33	Telangana	139.75	83.85	0
34	Tripura	32.64	25.06	0.34
35	Uttarakhand	15.24	7.79	4.02
36	Uttar Pradesh	32.1	18.53	1.73
37	West Bengal	102.56	75.31	34.47
	All India	**1,936.15**	**1,181.57**	**133.14**

Source: http://dilrmp.gov.in accessed as on Feb 2020

Box A2.1: Sample Coverage under Extent of Digitisation of Land Records

STAGE I

Selection of Tehsils: Involves following steps

Step1:
Identifying States/UTs with digitized land records- According to the DoLR website, out of 37 States/UTs, 31 States/UTs were found to have digitized Record of Rights (RORs), while 26 States/UTs have digitized Cadastral Maps (CMs). Therefore, in all samples were drawn for 31 States/UTs.

Step2:
Identifying districts- In order to have universal representation in sample all districts either fully or partially digitized with respect to ROR/CMs were covered. A total of 634 districts have been covered from 31 sample States/UTs for the study.

Step3:
Stratification of tehsils within districts- All tehsils either fully or partially digitized, were considered for sampling purpose. District-wise all tehsils were bifurcated into two stratums: 1) tehsils with digitized CMs (assuming here that these tehsils will also have digitized RORs but may or may not have linkages between them); and 2) tehsils with digitized RORs but not digitized CMs.

Step4:
Selection of tehsils- Based on the proportion of total number of tehsils in each stratum (where relevant), five tehsils were selected from each district from both stratums together using Probability Proportional to Size (PPS) without replacement technique wherein the size indicator is 'total number of villages per tehsil' as available on the DoLR data base. The DoLR data shows that out of 6,329 tehsils in India (31 States/UTs), 5,568 tehsils have digitized RORs and 3,542 tehsils have digitized CMs (either fully or in part) (Annexure Tables A2.1 and A2.2). The distribution of digitized tehsils across stratums shows 3,539 tehsils in Stratum 1 and 2,108 in Stratum 2. Of these, 2,859 tehsils (1741 tehsils in stratum 1 and 1118 tehsils in stratum 2) were selected in the Study sample (refer Annexure Table A2.3).

STAGE II

Selection of Revenue Villages

A maximum of 12 villages per sample tehsil were selected using circular systematic random sampling technique. For this purpose, only digitized villages as reported on the DoLR website were considered. In all, 60 revenue villages were selected from each district.

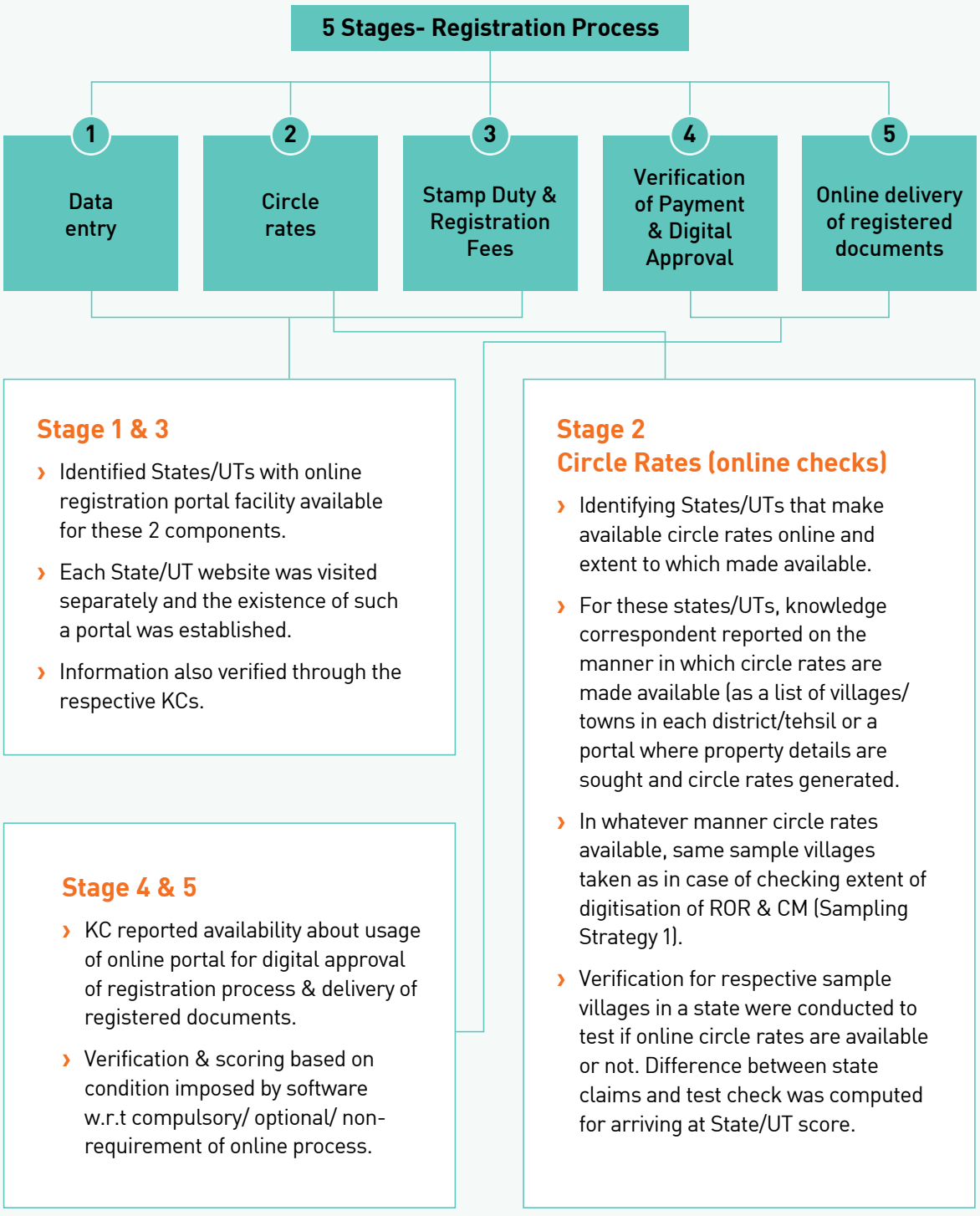
STAGE III

Selection of Khasra/Plot Numbers

The third stage involved random selection of one Khasra or plot from each sample village. The Khasra (Plot) number is the primary survey unit in the study through which the project team evaluated the extent of digitisation for the State/UT. Overall, a maximum of 60 khasra/plot numbers were taken from each district.

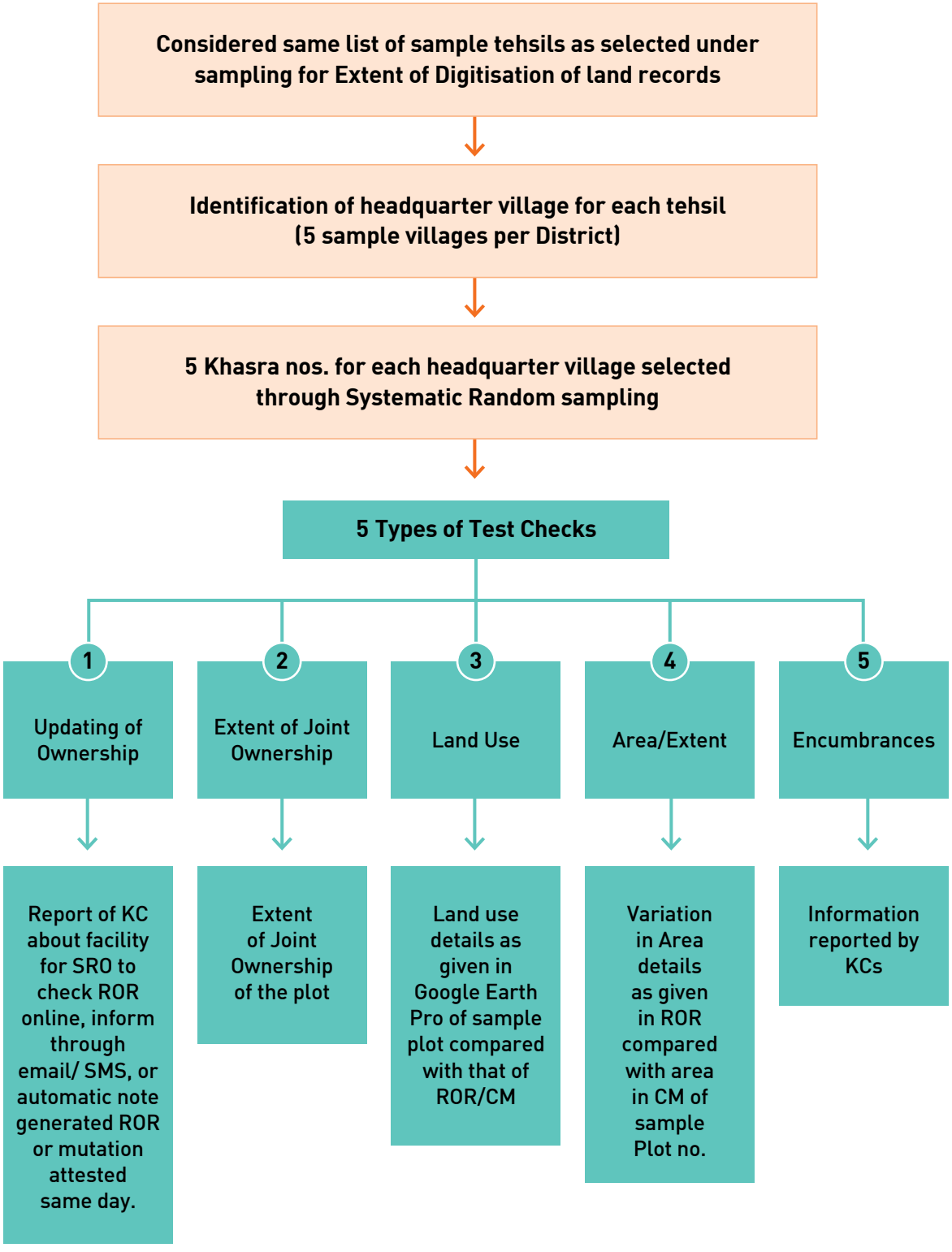
(Refer Annexure Table A2.4 for sample details and Illustration A2.1 for procedure)

Box A2.2: Sampling Framework for Digitisation of Registration Process



Notes: In theory, the best way to assess this might have been to use a database of transactions which have been registered in a past period (say last two financial years) and drawing samples thence to check the extent to which the five steps were used on-line in these transactions. In practice however, the first limitation with this approach is being able to access the relevant data base, since this kind of information is not available in the public domain. Even if an appropriate sample could be drawn with the assistance of the KCs, the second limitation that arises is that test-checking for all the five stages would require access to a secure network that is only available to specified personnel working in the Registration Department of the respective State/UT. Considering these limitations, an alternative approach has been adopted to find out the extent to which the on-line system is available for prospective transactions and where relevant, devising the sampling strategy for the test-checks.

Box A2.3: Sampling Framework for Test Checks relating to Quality of the Land Records



Notes: The sample selection of khasra numbers has been done for the second, third and fourth stages.

Box A2.4: Test Check Process for Registration Verification

The test checks for the registration process was divided into five stages:

Data Entry of Proposed Registration

Desk research established if a State / UT provides an on-line portal facility for users to fill in details for registration. KCs were then requested to verify this information. However, the back-end business processes used by the State/UTs and their efficiency, were not tested under this study.

Circle Rates

The test-checks were undertaken for the on-line availability of circle rates in sampled villages of a State/UT through the same process as for the dipstick tests for digitisation of RoRs and CMs.

On-line Payment of Stamp Duty and Registration Fees

Desk-research and information gathered from KCs were used to establish whether payment of stamp duty or registration fees is possible through an E-Gras type online payment portal, or through E-Stamps or if neither facility was available.

Completion of Registration Process with Digital Signature

The KCs reported on the extent of availability and use of such a facility. In effect, they reported on whether software is available and whether it is compulsory or optional for SROs to verify and digitally attest the registration papers.

Immediate Delivery of the Registered Document

A process similar to the one followed in the earlier step, was adopted in this case.

Box A2.5: Sample Selection Process: Challenges and Solutions

Some of the challenged faced during the process of sample selection and the possible solutions thereof have been listed here:

Extraction and compilation of sampling framework

The most important component for drawing up a sample is access to the sampling frame. The sampling frame could be a list or database of all those within a population whence a sample can be chosen, like in this case, it was the village-level database for land records. The major challenge faced was how to ascertain the sampling frame as this was not readily available. The required database was available on the DoLR website but records were amenable to be downloaded at village-level one at a time for the States/UTs. This was tedious and time-consuming exercise, first for extracting the village-data for each tehsil. This had to be followed by compiling the data for the district and the State/UT. There were inconsistences and administrative changes that made this task onerous and vulnerable to errors.

Duplication of village records

A number of duplicate village entries were found while extracting RoRs. This required elaborate data-cleaning and verification of constituent villages, tehsils and districts.

Data updation on DoLR

While extracting village level files from the DoLR website, it was found that the data was subject to a process of updating and change. This required freezing the time slots for data extraction of each state/UT after which further changes were not considered.

Data discrepancy issues

Since there was a discrepancy between the district-level / tehsil-level aggregates and actual unit-level data for villages, data available at district/tehsil level from DoLR portal could not be used for generating stratums. For example, in case of RORs/CMs, while some tehsils claimed 100% digitisation, actual village level information revealed a different picture. For stratification and sample selection purpose, aggregates at district/ tehsil level were re-calculated assuming village data to be more reliable than aggregates at tehsil and districts as reported on the portal.

Incomplete/Inaccessible data

For the state of Andhra Pradesh, the Study was not able to access the village level RoR information for nearly 50 percent of the tehsils from DoLR website. To download the full database, specialised software assistance was used by the Team.

Box A2.5: Sample Selection Process: Challenges and Solutions

Some of the challenged faced during the process of sample selection and the possible solutions thereof have been listed here:

6 Server issues

Other factors that affected the work timings for the entire exercise were related to access to the servers including slow speed for accessing or downloading files, unresponsive websites, re-starting due to unresponsiveness of the query, multiple attempts etc. All this resulted in a decision to dedicate a separate chapter of the report to discuss access issues.

7 Census data limitations

In cases where Census 2011 data was used for range identification, various challenges were faced due to huge time gap between two datasets such as matching sample village names in census data due to difference in spellings or reorganisation of villages in different tehsils/districts. In a few cases, the sample villages were not found in Census 2011 data for which the range was fixed during the test checks stage. In other cases, the actual range for khasra numbers in sample villages (census households) did not match at all and therefore, in such cases random khasra numbers were generated afresh after working out a revised range.

8 Identification of plots / khasra number ranges

The selection of sample khasra numbers from headquarter villages required the range of khasra numbers in that village and this was not always available. For fixing the range for each such village, in the first stage, portals of States /UTs were checked for availability of a drop-down facility with all khasra numbers. This check enabled covering only 10 States/UTs. For the remaining States/UTs, the number of households available from Census data 2011 have been used as a proxy for the khasra number range.

9 Problems with drop-down lists for khasra / plot numbers

While identifying the khasra /plot number ranges for each headquarter village, the problem of having to repeatedly enter Captcha codes was reported in some States/UTs that resulted in substantial delays.

Box A2.6: Test Check Process for the Quality of Land Records

The details of the process used to check the quality of the land records with respect to the five identified elements is as follows:

Updating of Ownership

Reports were obtained from KCs about the following stages in a linkage between the registration process and land records:

- Whether SROs can check the RoR online while carrying out the registration;
- Whether information by SMS/e-mail is immediately sent to the revenue office responsible for entering mutation on completion of registration;
- Whether a note is automatically generated in the RoR on completion of registration; and
- Whether the mutation relating to the registered transaction is attested the same day.

Extent / Area

For assessing quality of records of area, variation between area given in the RoR and that in the digitized cadastral map of the same khasra / plot / survey number were compared. During these checks, it was found that the digitized CMs belonged to one of the following categories:

- Where the area is given in both RoR and the CM and these largely do not correspond with each other (less than 20% perfect correspondence) - in such cases the figures were accepted as such and no further checks were carried out.
- Where the area given in the RoR and the CM correspond perfectly (in more than 20% of the cases), there it was necessary to compute the actual area in the CM by feeding the line lengths into an appropriate programme.
- Where in (ii) preceding, line lengths were not available, no test-checks were possible.

Test checks as possible were performed on five sample khasra numbers selected from headquarter villages falling in stratum 1 tehsils only (i.e. where both CM and ROR are digitized). The difference in extent/area of land as given in ROR and CM in percentage terms formed the basis for awarding points under this element.

Extent of Joint Ownership

These test-checks were performed online on five sample khasra numbers per head quarter village in each selected tehsil in both stratums: 1 and 2 (i.e. either with digitized ROR + CM or digitized ROR only).

Land Use

For these test checks, five sample khasra numbers per headquarter village were considered only from stratum 1 tehsils (where both CM and ROR are digitized). For this, the land use details as noted in respective ROR, were verified using remote sensing images from Google Maps Earth Pro database and the difference between the two was ascertained, reflecting the extent of variation in the record and the on-ground situation. For these checks, appropriate physical features visible in google maps were identified and direction and distance were calculated for locating and viewing the selected plot. Wherever it was not possible to locate sample plots with physical features identifiable on both the village mosaic and Google Maps Earth Pro, an attempt was made to select plots that had readily identifiable physical features that could in turn be used for verification of the relevant physical features noted in the records. The final scores awarded reflects the extent of identity / variation between the use noted in ROR and Google Maps Earth Pro.

Encumbrances

Reports were obtained from KCs about the type of encumbrances recorded in the RoR and points awarded to States / UTs accordingly.

Illustration A2.1: Procedure for Selecting Sample Tehsils

Steps Involved in tehsil Selection through PPS.

- Suppose in District A, out of 10 digitized tehsils, 5 need to be selected.
- Calculate the sampling interval (SI) by dividing the sum of 'size indicator' (N) by the number of tehsils to be selected (n=5).
- Choose a random starting point (X1) between 1 and N.
- The first tehsil will be where the X1 individual is found, based on the cumulative frequency column. The second cluster will be in the tehsil where the value X2 is located (X1 + SI), and so on. In case, where X value goes higher than N than subtract N to restart selection from the top (circular procedure).

State/District Name: Tamil Nadu (District-Cuddalore)

Tehsils	No of Digitised Villages CMs: No of villages per tehsil		No of Digitised Villages ROR	Stratum (1= CM& ROR, 2= ROR)	Cumulative on total villages	Random Nos	Selected Tehsils
Bhuvanagiri	72	30	72	1	72	X1=RS= 9	1
Chidambaram	113	75	113	1	185	X2=186	-
Cuddalore	81	71	81	1	266	X3=362	2
Kattumannarkoil	120	76	120	1	386	X4=539	3
Kurinjipadi	64	30	64	1	450	X5=715	-
Panruti	98	32	98	1	548	-	4
Srimushnam	51	21	51	1	599	-	-
Tittakudi	107	28	107	1	706	-	-
Vepur	53	20	53	1	759	-	5
Virudhachalam	124	49	124	1	883	-	-

Notes: 1. Stratum (1= CM+ ROR, 2= ROR); 2. SI- Sampling Interval; 3. RS: Random Start; X1...X5 are random nos. where X2= X1+SI and so on. (Sampling Interval= 883/5= 177)

Table A2.1: State-wise Status of Digitisation of RORs

S. No.	State/ UTs	Total			Digitised RORs			Digitised RORs (% Distribution)		
		Districts	Tehsils	Villages	Districts	Tehsils	Villages	Districts	Tehsils	Villages
1	Andaman & Nicobar Islands	3	10	205	3	7	182	100	70	88.8
2	Andhra Pradesh	13	670	17,563	13	655	17,064	100	97.8	97.2
3	Assam	33	174	26,206	23	120	15,454	69.7	69	59
4	Bihar	38	534	46,370	38	492	30,354	100	92.1	65.5
5	Chhattisgarh	27	150	20,496	27	147	18,215	100	98	88.9
6	Dadra & Nagar Haveli	1	11	72	1	11	72	100	100	100
7	Daman & Diu	2	2	28	2	2	22	100	100	78.6
8	Delhi	11	33	207	11	21	193	100	63.6	93.2
9	Goa	2	12	425	2	7	225	100	58.3	52.9
10	Gujarat	33	271	18,527	33	247	17,686	100	91.1	95.5
12	Haryana	22	143	7,142	22	108	6,581	100	75.5	92.1
11	Himachal Pradesh	12	131	21,797	12	104	16,858	100	79.4	77.3
13	Jammu & Kashmir	18	76	521	14	29	521	77.8	38.2	100
14	Jharkhand	24	268	33,092	24	263	31,330	100	98.1	94.7
15	Karnataka	30	179	29,577	30	174	27,432	100	97.2	92.7
16	Kerala	14	77	788	14	65	726	100	84.4	92.1
17	Lakshadweep	1	10	24	1	10	24	100	100	100
20	Madhya Pradesh	52	350	55,070	52	342	54,759	100	97.7	99.4
18	Maharashtra	35	358	44,855	35	357	43,697	100	99.7	97.4
19	Manipur	16	87	1,879	4	23	423	25	26.4	22.5
21	Odisha	30	516	51,701	30	317	51,609	100	61.4	99.8
22	Puducherry	2	8	130	2	6	117	100	75	90
23	Punjab	22	84	12,891	22	82	12,076	100	97.6	93.7
24	Rajasthan	33	318	47,921	33	312	45,772	100	98.1	95.5
31	Sikkim	4	75	422	4	75	417	100	100	98.8
25	Tamil Nadu	32	305	16,786	32	298	16,689	100	97.7	99.4
26	Telangana	33	589	10,829	33	444	10,737	100	75.4	99.2
27	Tripura	8	79	897	8	45	896	100	57	99.9
28	Uttar Pradesh	75	338	107,145	75	337	105,205	100	99.7	98.2
29	Uttarakhand	13	128	17,164	13	126	15,869	100	98.4	92.5
30	West Bengal	22	343	42,172	22	342	41,380	100	99.7	98.1
States/UTs Total*		**661**	**6,329**	**632,902**	**635**	**5,568**	**582,585**	**96.1**	**88**	**92**

Notes: * Sample excludes 6 States/UTs: Nagaland, Arunachal Pradesh, Mizoram, Chandigarh, Ladakh and Meghalaya
Source: Based on States data extracted from DoLR website: www.dolr.gov.in, last accessed on Sept 20, 2019.

Table A2.2: State-wise Status of Digitisation of CMs

S. No.	State/ UTs	Total			Digitised RORs			Digitised RORs (% Distribution)		
		Districts	Tehsils	Villages	Districts	Tehsils	Villages	Districts	Tehsils	Villages
1	Andaman & Nicobar Islands	3	10	205	3	6	176	100.0	60.0	85.9
2	Andhra Pradesh	13	670	17,563	3	13	226	23.1	1.9	1.3
3	Assam	33	174	26,206	22	119	14,255	66.7	68.4	54.4
4	Bihar	38	534	46,370	38	528	41,599	100.0	98.9	89.7
5	Chhattisgarh	27	150	20,496	26	139	17,374	96.3	92.7	84.8
6	Dadra & Nagar Haveli	1	11	72	1	11	72	100.0	100.0	100.0
7	Daman & Diu	2	2	28	0	0	0	0.0	0.0	0.0
8	Delhi	11	33	207	0	0	0	0.0	0.0	0.0
9	Goa	2	12	425	2	12	425	100.0	100.0	100.0
10	Gujarat	33	271	18,527	22	117	6,967	66.7	43.2	37.6
11	Haryana	22	143	7,142	21	85	5,660	95.5	59.4	79.2
12	Himachal Pradesh	12	131	21,797	12	111	18,475	100.0	84.7	84.8
13	Jammu & Kashmir	18	76	521	0	0	0	0.0	0.0	0.0
14	Jharkhand	24	268	33,092	24	246	25,317	100.0	91.8	76.5
15	Karnataka	30	179	29,577	0	0	0	0.0	0.0	0.0
16	Kerala	14	77	788	11	24	118	78.6	31.2	15.0
17	Lakshadweep	1	10	24	0	0	0	0.0	0.0	0.0
18	Madhya Pradesh	52	350	55,070	48	316	45,970	92.3	90.3	83.5
19	Maharashtra	35	358	44,855	34	149	8,748	97.1	41.6	19.5
20	Manipur	16	87	1,879	1	10	171	6.3	11.5	9.1
21	Odisha	30	516	51,701	30	317	51,610	100.0	61.4	99.8
22	Puducherry	2	8	130	1	5	86	50.0	62.5	66.2
23	Punjab	22	84	12,891	8	19	1,509	36.4	22.6	11.7
24	Rajasthan	33	318	47,921	11	46	4,436	33.3	14.5	9.3
25	Sikkim	4	75	422	4	73	399	100.0	97.3	94.5
26	Tamil Nadu	32	305	16,786	32	274	8,451	100.0	89.8	50.3
27	Telangana	33	589	10,829	33	448	8,733	100.0	76.1	80.6
28	Tripura	8	79	897	8	32	693	100.0	40.5	77.3
29	Uttar Pradesh	75	338	108,727	34	81	12,851	45.3	24.0	11.8
30	Uttarakhand	13	128	17,164	4	20	4,093	30.8	15.6	23.8
31	West Bengal	22	343	42,172	22	341	38,931	100.0	99.4	92.3
	States/UTs Total*	**661**	**6,329**	**634,484**	**455**	**3,542**	**317,345**	**68.8**	**56.0**	**50.0**

Notes: *Sample excludes 6 states/UTs: Nagaland, Arunachal Pradesh, Mizoram, Chandigarh, Ladakh and Meghalaya
Source: Based on States data extracted from DoLR website: www.dolr.gov.in, last accessed on Sept 20, 2019.

Table A2.3: State/UT -Wise Stratification of Digitised and Sample Tehsils

		Total Tehsils			Sample Tehsils		
		Strata 1	Strata 2	All Stratums	Strata 1	Strata 2	All Stratums
1	Andaman & Nicobar Islands	6	1	7	6	1	7
2	Andhra Pradesh	13	642	655	3	62	65
3	Assam	117	7	124	90	7	97
4	Bihar	528	5	533	186	4	190
5	Chhattisgarh	139	9	148	111	9	120
6	Dadra & Nagar Haveli	11	0	11	5	0	5
7	Daman & Diu	0	1	1	0	1	1
8	Delhi	0	21	21	0	21	21
9	Goa	12	0	12	10	0	10
10	Gujarat	117	132	249	67	91	158
11	Haryana	85	23	108	74	18	92
12	Himachal Pradesh	111	6	117	53	5	58
13	Jammu & Kashmir**	0	29	29	0	28	28
14	Jharkhand	246	17	263	112	8	120
15	Karnataka	0	176	176	0	139	139
16	Kerala	24	42	66	22	39	61
17	Lakshadweep	0	10	10	0	5	5
18	Madhya Pradesh	315	27	342	217	24	241
19	Maharashtra	149	208	357	78	94	172
20	Manipur	10	13	23	5	11	16
21	Odisha	317	0	317	146	0	146
22	Puducherry	5	2	7	5	2	7
23	Punjab	19	63	82	17	61	78
24	Rajasthan	47	266	313	25	139	164
25	Sikkim**	73	2	75	18	2	20
26	Tamil Nadu	274	24	298	132	20	152
27	Telangana	448	5	453	160	5	165
28	Tripura	32	13	45	26	11	37
29	Uttar Pradesh	81	256	337	61	252	313
30	Uttarakhand	20	106	126	7	57	64
31	West Bengal	340	2	342	105	2	107
	States Total*	**3,539**	**2,108**	**5,647**	**1,741**	**1,118**	**2,859**

Notes: *Sample excludes 6 states/UTs: Nagaland, Arunachal Pradesh, Mizoram, Chandigarh, Ladakh and Meghalaya. Actual test checks conducted for land records (RoRs & CMs) on 29 states/UTs excluding Sikkim** and J&K** for which either portal were not available. But in case of Circle rates, 23 States/UTs were covered including Sikkim & J&K.

Source: Based on the aggregates calculated from States/UTs data extracted from DoLR.

Table A2.4: State-wise Sample Summary for Extent of Digitisation of Land Records*

		Districts	Tehsils	Villages	Plots for RORs	Plots for CMs
1	Andaman & Nicobar Islands	3	7	72	72	N.A
2	Andhra Pradesh	13	65	777	777	36
3	Assam	23	97	1,154	1,154	N.A
4	Bihar	38	190	2,280	2,280	N.A
5	Chhattisgarh	27	120	1,435	1,435	1,338
6	Dadra & Nagar Haveli	1	5	42	42	N.A
7	Daman & Diu	2	1	12	12	**
8	Delhi	11	21	134	134	**
9	Goa	2	10	120	120	N.A
10	Gujarat	33	158	1,893	1,893	N.A
11	Haryana	22	92	1,104	1,104	N.A
12	Himachal Pradesh	12	58	696	696	636
13	Jharkhand	24	120	1,440	1,440	1,344
14	Karnataka	30	139	1,608	1,608	**
15	Kerala	14	61	422	N.A	105
16	Lakshadweep	1	5	19	19	19
17	Madhya Pradesh	52	241	2,890	2,890	2,602
18	Maharashtra	35	172	2,039	2,039	711
19	Manipur	4	16	183	183	N.A
20	Odisha	30	146	1,752	1,752	1,752
21	Puducherry	2	7	73	73	N.A
22	Punjab	22	78	927	927	N.A
23	Rajasthan	33	164	1,961	1,961	281
24	Tamil Nadu	31	152	1,797	1,797	1,545
25	Telangana	33	165	1,936	1,936	1,884
26	Tripura	8	37	430	430	N.A
27	Uttar Pradesh	75	313	3,750	3,750	702
28	Uttarakhand	13	64	768	768	N.A
29	West Bengal	22	107	1,284	1,284	1,272
	All States/UTs*	**616**	**2,811**	**32,998**	**32,576**	**14,227**

Notes: 1. *Sample excludes 8 states/UTs: Nagaland, Arunachal Pradesh, Mizoram, Chandigarh, Meghalaya, Ladakh, Sikkim and J&K. 2. For RoRs, samples from 28 States/UTs were tested excluding Kerala, while in case of CMs, samples from 14 States/UTs were tested. 3. N.A - Not accessible 4. **Not Available
Source: Sample extracted from States/UTs data available from DoLR website: www.dolr.gov.in, last accessed on Sept 20, 2019.

Table A2.5: State-wise Sample Summary for Circle Rates (Registration Process)

		Districts	Tehsils	Villages	Sample Tested
1	Andhra Pradesh	13	65	777	777
2	Bihar	38	190	2,280	2,280
3	Chhattisgarh	27	120	1,435	1,435
4	Goa	2	10	120	120
5	Gujarat	33	158	1,893	1,893
6	Haryana	22	92	1,104	1,104
7	Himachal Pradesh	12	58	696	696
8	J&K	14	28	253	253
9	Jharkhand	24	120	1,440	1,440
10	Karnataka	30	139	1,608	1,512
11	Kerala	14	61	422	422
12	Madhya Pradesh	52	241	2,890	2,890
13	Maharashtra	35	172	2,039	2,039
14	Odisha	30	146	1,752	1,752
15	Puducherry	2	7	73	73
16	Punjab	22	78	927	927
17	Rajasthan	33	164	1,961	1,961
18	Sikkim	4	20	149	149
19	Tamil Nadu	31	152	1,797	1,797
20	Telangana	33	165	1,936	1,936
21	Uttar Pradesh	75	313	3,750	3,750
22	Uttarakhand	13	64	768	768
23	West Bengal	22	107	1,284	1,284
	All States/UTs	**581**	**2,670**	**31,354**	**31,258**

Notes: For circle rates, a sample drawn from 23 States/UTs were tested. The overall failure rate is just 0.3%.
Source: Sample extracted from States/UTs data available from DoLR website: www.dolr.gov.in, last accessed on Sept 20, 2019.

Table A2.6: State-wise Sample Summary for the Quality of Land Records

S. No.	State/ UTs	Sample Districts	Sample Tehsils	Sample Headquarter villages	Sample Khasra Nos.
1	Andaman & Nicobar Islands	3	7	7	35
2	Andhra Pradesh	13	65	65	325
3	Assam	23	97	97	485
4	Bihar	38	190	190	950
5	Chhattisgarh	27	120	120	600
6	Dadra & Nagar Haveli	1	5	5	25
7	Daman & Diu	2	1	1	5
8	Delhi	11	21	21	105
9	Goa	2	10	10	50
10	Gujarat	33	158	158	790
11	Haryana	22	92	92	460
12	Himachal Pradesh	12	58	58	290
13	Jharkhand	24	120	120	600
14	Karnataka	30	139	139	695
15	Lakshadweep	1	5	5	25
16	Madhya Pradesh	52	241	241	1,205
17	Maharashtra	35	172	172	860
18	Manipur	4	16	16	80
19	Odisha	30	146	146	730
20	Puducherry	2	7	7	35
21	Punjab	22	78	78	390
22	Rajasthan	33	164	164	820
23	Tamil Nadu	31	152	152	760
24	Telangana	33	165	165	825
25	Tripura	8	37	37	185
26	Uttar Pradesh	75	313	313	1,565
27	Uttarakhand	13	64	64	320
28	West Bengal	22	107	107	535
	All States/UTs Total*	**602**	**2,750**	**2,750**	**13,750**

Notes: 1. Extent of Joint Ownership test checked for 28 States/UTs excluding 9 States/UTs: Nagaland, Arunachal Pradesh, Mizoram, Sikkim, Chandigarh, Meghalaya, Ladakh, J&K and Kerala. 2. Land use test checked for 10 States/UTs covering 3282 plots. 3. Land Area/Extent test checked for 9 States/UTs covering 2679 plots.
Source: Sample extracted from States/UTs data available from DoLR website: www.dolr.gov.in, last accessed on Sept 20, 2019.

Table A3.1 Area with Land Records

	States/UTs	% of Area with land records
1	Andaman & Nicobar Islands	96.9
2	Andhra Pradesh	100.0
3	Arunachal Pradesh	0.0
4	Assam	100.0
5	Bihar	80.2
6	Chandigarh	0.0
7	Chhattisgarh	100.0
8	Dadra & Nagar Haveli	100.0
9	Daman & Diu	100.0
10	Goa	100.0
11	Gujarat	100.0
12	Haryana	100.0
13	Himachal Pradesh	100.0
14	Jammu & Kashmir	0.0
15	Jharkhand	100.0
16	Karnataka	100.0
17	Kerala	100.0
18	Ladakh	0.0
19	Lakshadweep	100.0
20	Madhya Pradesh	100.0
21	Maharashtra	100.0
22	Manipur	89.0
23	Meghalaya	0.0
24	Mizoram	0.0
25	Nagaland	0.0
26	Delhi	25.3
27	Odisha	100.0
28	Puducherry	100.0
29	Punjab	100.0
30	Rajasthan	98.1
31	Sikkim	0.0
32	Tamil Nadu	100.0
33	Telangana	100.0
34	Tripura	100.0
35	Uttarakhand	100.0
36	Uttar Pradesh	100.0
37	West Bengal	100.0

Source: N-LRSI 2019-20, NCAER

Table A3.2: RoR Digitization: Comparison between DoLR & N-LRSI Test Checks

		Percentage of villages with digitised RORs (DoLR)	Percentage of villages with digitised RORs (Normalized Test Checks)
1	Andaman & Nicobar Islands	98.1	88.5
2	Andhra Pradesh	97.2	93.3
3	Assam	58.3	52.8
4	Bihar	65.3	56.5
5	Chhattisgarh	100	95.7
6	Dadra & Nagar Haveli	100	100
7	Daman & Diu	78.6	78.6
8	Delhi	94.7	91.2
9	Goa	97.0	94.5
10	Gujarat	96.4	93.2
11	Haryana	92.9	71.1
12	Himachal Pradesh	100	83
13	Jharkhand	99.1	69.8
14	Karnataka	99.6	73.8
15	Lakshadweep	100	84.2
16	Madhya Pradesh	100	93.1
17	Maharashtra	100	92.3
18	Manipur	15.6	13.3
19	Odisha	100.0	99.8
20	Puducherry	100.0	91.8
21	Punjab	93.6	84.6
22	Rajasthan	96.8	93.1
23	Tamil Nadu	99.9	92.7
24	Telangana	99.4	83.3
25	Tripura	99.9	90.8
26	Uttar Pradesh	96.2	91.1
27	Uttarakhand	94.4	90.9
28	West Bengal	98.1	88.9

Note: The sample test checks were carried out in multiple rounds between August, 2019 and January, 2020
Source: N-LRSI 2019-20, NCAER

Table A3.3 Reasons for Failure in RoR Test Checks (Percentage of Sampled Plots)

0 | 1-50 | 51-75 | 76-100

		District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Plot no./ khasra no. not available in dropdown	RoR does not appear	Server Issue	Others
1.	Andaman & Nicobar Islands	0	100.00	0	0	0	0	0
2.	Andhra Pradesh	0	0	51.61	48.39	0	0	0
3.	Assam	22.94	44.04	25.69	0	0	0	7.34
4.	Bihar	0	19.54	40.39	40.07	0	0	0
5.	Chhattisgarh	0	38.71	61.29	0	0	0	0
6.	Goa	0	0	100.00	0	0	0	0
7.	Gujarat	0	0	92.19	7.81	0	0	0
8.	Haryana	0	0	29.73	0	0	66.80	3.47
9.	Himachal Pradesh	0	0	100.00	0	0	0	0
10.	Jharkhand	0	2.82	10.56	32.63	53.99	0	0
11.	Karnataka	0	0	76.98	23.02	0	0	0
12.	Lakshadweep	0	0	0	100.00	0	0	0
13.	Madhya Pradesh	0	0	100.00	0	0	0	0
14.	Maharashtra	0	0	78.21	21.79	0	0	0
15.	Manipur	0	44.44	48.15	0	0	0	7.41
16.	Delhi	0	0	80.00	20.00	0	0	0
17.	Odisha	0	0	100.00	0	0	0	0
18.	Puducherry	0	0	100.00	0	0	0	0
19.	Punjab	0	0	100.00	0	0	0	0
20.	Rajasthan	0	0	17.57	0	13.51	0	68.92
21.	Tamil Nadu	0	0	16.41	83.59	0	0	0
22.	Telangana	0	19.05	66.67	9.21	1.27	0	3.81
23.	Tripura	0	5.13	87.18	0	7.69	0	0
24.	Uttarakhand	0	0	78.57	21.43	0	0	0
25.	Uttar Pradesh	0	0	34.33	0	0	0	65.67
26.	West Bengal	0	0	90.91	9.09	0	0	0

Source: N-LRSI 2019-20, NCAER

Table A4.1 CM Digitization: Comparison between DoLR & N-LRSI Test Checks

		Percentage of villages with digitised CMs (DoLR)	Percentage of villages with digitised CMs (Normalized Test Checks)
1	Odisha	100.00	99.89
2	Chhattisgarh	100.00	87.97
3	Lakshadweep	100.00	78.95
4	Madhya Pradesh	100.00	77.86
5	West Bengal	92.28	79.00
6	Himachal Pradesh	88.19	36.33
7	Telangana	80.64	66.95
8	Maharashtra	76.89	49.31
9	Jharkhand	76.85	57.29
10	Tamil Nadu	50.35	45.49
11	Uttar Pradesh	11.78	9.82
12	Rajasthan	9.26	5.30
13	Kerala	6.97	4.78
14	Andhra Pradesh	1.29	1.29

Note: The sample test checks were carried out in multiple rounds between August, 2019 and January, 2020
Source: N-LRSI 2019-20, NCAER

Table A4.2 Reasons for Failure in CM test checks (Percentage of sampled plots)

0 1-50 51-75 76-100

		District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Plot no./ khasra no. not available in dropdown	RoR does not appear	Server Issue	Others
1	Chhattisgarh	0	14.91	33.54	0	51.55	0	0
2	Himachal Pradesh	12.87	9.65	63.81	0	0	12.60	1.07
3	Jharkhand	0	10.82	57.31	31.87	0	0	0
4	Kerala	0	6.06	45.45	0	48.48	0	0
5	Lakshadweep	0	0	100.00	0	0	0	0
6	Madhya Pradesh	0	0	55.21	44.79	0	0	0
7	Maharashtra	0	28.24	41.18	6.27	0	0	24.31
8	Odisha	0	0	100.00	0	0	0	0
9	Rajasthan	0	90.00	0.83	0	9.17	0	0
10	Tamil Nadu	0	0	13.42	8.05	78.52	0	0
11	Telangana	0	7.52	74.61	5.33	3.45	6.90	2.19
12	Uttar Pradesh	0	5.13	91.45	0	0	0	3.42
13	West Bengal	0	0	0	0	100.00	0	0

Source: N-LRSI 2019-20, NCAER

Table A5.1 Reasons for Failure in Test Checks for Online Availability of Circle Rates (Percentage of Sampled Villages)

0 1-50 51-75 76-100

		District not available in dropdown	Tehsil not available in dropdown	Village not available in dropdown	Plot no./ khasra no. not available in dropdown	RoR does not appear	Server Issue	Others
1	Andhra Pradesh	0	0	100.00	0	0	0	0
2	Bihar	0	12.95	82.01	0	5.04	0	0
3	Chhattisgarh	0	98.26	1.74	0	0	0	0
4	Goa	0	0	100.00	0	0	0	0
5	Gujarat	0	6.34	2.29	4.23	14.79	0	72.36
6	Haryana	0	0	100.00	0	0	0	0
7	Himachal Pradesh	0	0	87.95	0	0	0	0
8	Jammu & Kashmir	0	0	100.00	0	0	0	0
9	Jharkhand	68.09	6.38	25.53	0	0	0	0
10	Karnataka	18.07	0	66.87	0	15.06	0	0
11	Kerala	0	80.00	20.00	0	0	0	0
12	Madhya Pradesh	0	0	100.00	0	0	0	0
13	Maharashtra	0	0	100.00	0	0	0	0
14	Odisha	0	0	40.41	0	0	0	0
15	Punjab	0	0	59.93	0	0	0	40.07
16	Puducherry	0	0	100.00	0	0	0	0
17	Rajasthan	0	0	96.88	0	3.13	0	0
18	Sikkim	0	0	100.00	0	0	0	0
19	Tamil Nadu	0	0	0	0	76.67	23.33	0
20	Telangana	0	11.39	62.66	0	23.10	0	0
21	Uttarakhand	0	0	69.62	0	30.38	0	0
22	Uttar Pradesh	19.86	49.59	18.08	0	0	0	0
23	West Bengal	0	6.13	67.41	0	26.46	0	0

Note: The sample test checks were carried out in multiple rounds between August, 2019 and January, 2020
Source: N-LRSI 2019-20, NCAER

Table A5.2 Status of Digitisation of Registration

	States/UTs	Data entry	Payment		Circle rates availability	Verification	Delivery
			E-stamps	Online			
1	Andaman & Nicobar	✖	✔	✖	✖	✖	✖
2	Andhra Pradesh	✔	✖	✔	✔	✖	✔
3	Arunachal Pradesh	✖	✖	✖	✖	✖	✖
4	Assam	✖	✔	✖	✖	✖	✖
5	Bihar	✖	✔	✖	✔	✔	✖
6	Chandigarh	✖	✔	✖	✖	✖	✔
7	Chhattisgarh	✖	✔	✖	✔	✖	✖
8	Dadra & Nagar Haveli	✖	✔	✖	✖	✖	✖
9	Daman & Diu	✖	✓	✖	✖	✖	✖
10	Goa	✔	✖	✖	✔	✖	✖
11	Gujarat	✖	✔	✖	✔	✖	✖
12	Haryana	✔	✖	✔	✔	✖	✖
13	Himachal Pradesh	✖	✔	✖	✔	✖	✖
14	Jammu & Kashmir	✖	✖	✖	✔	✖	✖
15	Jharkhand	✔	✔	✖	✔	✖	✖
16	Karnataka	✔	✔	✖	✔	✔	✖
17	Kerala	✖	✔	✖	✔	✖	✖
18	Ladakh	✖	✖	✖	✖	✖	✖
19	Lakshadweep	✖	✖	✖	✖	✖	✖
20	Madhya Pradesh	✔	✖	✔	✔	✔	✔
21	Maharashtra	✔	✖	✔	✔	✔	✔
22	Manipur	✔	✔	✖	✖	✔	✔
23	Meghalaya	✖	✖	✖	✖	✖	✖
24	Mizoram	✖	✖	✖	✖	✖	✖
25	Nagaland	✖	✖	✖	✖	✖	✖
26	Delhi	✖	✔	✖	✖	✖	✖
27	Odisha	✖	✖	✔	✔	✔	✔
28	Puducherry	✖	✔	✖	✔	✖	✖
29	Punjab	✔	✔	✖	✔	✖	✔
30	Rajasthan	✔	✖	✔	✔	✖	✖
31	Sikkim	✖	✖	✖	✔	✖	✖
32	Tamil Nadu	✔	✖	✔	✔	✖	✔
33	Telangana	✔	✔	✖	✔	✖	✖
34	Tripura	✖	✖	✔	✖	✖	✖
35	Uttarakhand	✔	✔	✖	✔	✔	✔
36	Uttar Pradesh	✔	✔	✖	✔	✖	✔
37	West Bengal	✔	✖	✔	✔	✔	✔
Total		**15**	**19**	**9**	**23**	**8**	**11**

Source: N-LRSI 2019-20, NCAER and State/UT sources

Table A6.1. Integration between Land Records and Registration

	States/UTs	Integration as per DoLR = A Mutation per DoLR = B Both =C None =D	SROs can check RoR online while carrying registration	Information by SMS/e-mail to the revenue office responsible for entering mutation	On registration, automatic note is sent to RoR	Mutation attested same day
1	Andaman & Nicobar Islands	C	✖	✖	✖	✖
2	Andhra Pradesh	C	✔	✖	✖	✖
3	Assam	C	✔	✖	✖	✖
4	Bihar	C	✔	✖	✖	✖
5	Chhattisgarh	C	✔	✔	✖	✖
6	Dadra & Nagar Haveli	C	✖	✖	✖	✖
7	Daman & Diu	B	✔	✔	✖	✖
8	Goa	C	✔	✔	✖	✖
9	Gujarat	C	✔	✔	✖	✖
10	Haryana	C	✔	✔	✔	✖
11	Himachal Pradesh	C	✔	✔	✔	✖
12	Jharkhand	C	✔	✔	✔	✖
13	Karnataka	D	✔	✔	✖	✖
14	Kerala	C	✔	✔	✖	✖
15	Lakshadweep	D	✖	✖	✖	✖
16	Madhya Pradesh	C	✔	✔	✖	✖
17	Maharashtra	C	✔	✔	✔	✖
18	Manipur	B	✖	✖	✖	✖
19	Delhi	C	✖	✖	✖	✖
20	Odisha	C	✔	✖	✖	✖
21	Puducherry	B	✖	✖	✖	✖
22	Punjab	C	✔	✔	✖	✖
23	Rajasthan	C	✔	✔	✔	✖
24	Tamil Nadu	C	✔	✔	✔	✖
25	Telangana	C	✔	✔	✖	✖
26	Tripura	C	✔	✖	✖	✖
27	Uttarakhand	C	✔	✔	✖	✖
28	Uttar Pradesh	C	✔	✔	✔	✖
29	West Bengal	C	✔	✔	✖	✖

Source: N-LRSI 2019-20, NCAER and State/UT sources

Table A6.2 Extent of Joint Ownership (Percentage of Sampled Plots)

0 1-50 51-75 76-100

		1-2	3-5	6-10	11-15	16-20	21 above
1	Andaman & Nicobar Islands	83.3	10.0	6.7	0	0	0
2	Andhra Pradesh	90.2	7.3	0.6	0	0	0
3	Assam	32.8	15.2	20.2	10.9	5.8	15.2
4	Bihar	88.9	8.8	2.2	0	0.1	0
5	Chhattisgarh	76.4	16.6	6.5	0.3	0	0.2
6	Dadra & Nagar Haveli	80.0	4.0	12.0	0	0	4
7	Daman & Diu	80.0	8.0	12.0	0	0	0
8	Goa	74.3	11.4	8.6	0	2.9	2.9
9	Gujarat	57.0	19.1	14.6	5.6	1.9	1.7
10	Haryana	35.3	23.3	20.9	12.0	2.7	5.8
11	Himachal Pradesh	45.3	8.2	22.2	7.8	6.6	9.9
12	Jharkhand	85.7	11.2	2.5	0.6	0	0
13	Karnataka	75.3	15.1	6.0	1.9	0.7	0.9
14	Lakshadweep	64.0	28.0	4.0	4	0	0
15	Madhya Pradesh	72.4	16.9	8.4	1.3	0.6	0.4
16	Maharashtra	46.3	21.0	17.0	7.3	3.1	5.2
17	Manipur	85.7	12.9	1.4	0	0	0
18	Delhi	58.9	25.6	6.7	5.6	2.2	1.1
19	Odisha	74.7	15.7	6.9	1.3	0.7	0.7
20	Puducherry	94.3	2.9	2.9	0	0	0
21	Punjab	36.6	19.0	22.6	9.1	3.9	8.8
22	Rajasthan	57.1	16.0	14.3	4.4	3.4	4.9
23	Tamil Nadu	82.9	10.1	3.7	1.8	0.5	1
24	Telangana	100.0	0	0	0	0	0
25	Tripura	100.0	0	0	0	0	0
26	Uttarakhand	25.2	12.8	21.6	8.9	7.5	23.9
27	Uttar Pradesh	50.6	27.0	13.8	4.1	1.8	2.7
28	West Bengal	55.5	26.8	11.1	4.3	1.1	1.3

Note: The sample test checks were carried out between December, 2019 and January, 2020
Source: N-LRSI 2019-20, NCAER

Table A6.3 Land -use Congruence

		No. of CMs Checked	Landuse Consistency
1	Jharkhand	300	92%
2	Odisha	695	87%
3	Maharashtra	101	87%
4	Himachal Pradesh	30	80%
5	Uttar Pradesh	121	79%
6	West Bengal	334	77%
7	Telangana	571	74%
8	Rajasthan	75	71%
9	Chhattisgarh	424	65%
10	Madhya Pradesh	631	49%

Note: The sample test checks were carried out between December, 2019 and January, 2020

Source: N-LRSI 2019-20, NCAER

Table A6.4 Percentage of Plots by Range of Variation between area in ROR and CMs

		Land Area Variation between RoRs and CM/CAD		
		<5%	5%-10%	>10%
1	Lakshadweep	56.5	21.7	21.7
2	Odisha	30.1	20.9	49.1
3	Tamil Nadu	46.0	18.1	35.9
4	Chhattisgarh	2.3	0.9	96.7
5	Rajasthan	33.3	17.3	49.3
6	Madhya Pradesh	31.7	14.1	54.2
7	Jharkhand	35.7	17.3	47.0
8	Himachal Pradesh	9.7	2.9	87.4
9	Andhra Pradesh	55.6	33.3	11.1

Note: The sample test checks were carried out between December, 2019 and January, 2020

Source: N-LRSI 2019-20, NCAER

Table A6.5 Recording of Encumbrances

	States/UTs	Mortgages	Land Acquisition Proceedings	Revenue Court cases	Civil Court cases	Land use restrictions
1	Andaman & Nicobar Islands	✔	✖	✖	✖	✖
2	Andhra Pradesh	✖	✔	✔	✖	✖
3	Arunachal Pradesh	✖	✔	✖	✖	✖
4	Assam	✔	✖	✔	✖	✖
5	Bihar	✔	✖	✖	✖	✖
6	Chandigarh	✔	✔	✖	✖	✖
7	Chhattisgarh	✔	✖	✖	✖	✖
8	Dadra & Nagar Haveli	✔	✖	✖	✖	✖
9	Daman & Diu	✔	✔	✖	✖	✖
10	Goa	✔	✔	✔	✖	✖
11	Gujarat	✔	✔	✖	✖	✔
12	Haryana	✔	✔	✖	✖	✖
13	Himachal Pradesh	✔	✖	✖	✖	✔
14	Jammu & Kashmir	✔	✔	✖	✖	✖
15	Jharkhand	✔	✖	✔	✖	✔
16	Karnataka	✔	✔	✖	✖	✖
17	Kerala	✔	✔	✖	✖	✖
18	Ladakh	✔	✔	✖	✖	✖
19	Lakshadweep	✖	✔	✖	✖	✖
20	Madhya Pradesh	✔	✖	✖	✖	✔
21	Maharashtra	✔	✔	✖	✖	✔
22	Manipur	✔	✖	✖	✖	✖
23	Meghalaya	✖	✖	✖	✖	✖
24	Mizoram	✖	✖	✖	✖	✖
25	Nagaland	✖	✖	✖	✖	✖
26	NCT of Delhi	✔	✖	✔	✔	✖
27	Odisha	✔	✖	✖	✖	✖
28	Puducherry	✔	✖	✖	✖	✖
29	Punjab	✔	✖	✔	✖	✖
30	Rajasthan	✔	✖	✖	✖	✖
31	Sikkim	✔	✔	✖	✖	✖
32	Tamil Nadu	✖	✖	✖	✖	✖
33	Telangana	✔	✖	✖	✖	✖
34	Tripura	✔	✔	✖	✖	✖
35	Uttarakhand	✔	✖	✖	✖	✖
36	Uttar Pradesh	✖	✖	✔	✖	✖
37	West Bengal	✖	✔	✔	✔	✖
Total		28	15	8	2	5

Source: N-LRSI 2019-20, NCAER and state sources

Table A7.1: Extent of RoR Digitisation

		Scores for digitized RoRs (out of 15)	Legally Usable Copy of RoR (out of 5)	Extent of Digitization of RoR (out of 20)
1	Andaman & Nicobar Islands	12.9	0.0	12.9
2	Andhra Pradesh	14.0	2.5	16.5
3	Assam	7.9	0.0	7.9
4	Bihar	6.8	0.0	6.8
5	Chhattisgarh	14.4	5.0	19.4
6	Dadra & Nagar Haveli	15.0	5.0	20.0
7	Daman & Diu	11.8	2.5	14.3
8	Delhi	3.5	5.0	8.5
9	Goa	14.2	5.0	19.2
10	Gujarat	14.0	2.5	16.5
11	Haryana	10.7	0.0	10.7
12	Himachal Pradesh	12.5	2.5	15.0
13	Jharkhand	10.5	0.0	10.5
14	Karnataka	11.1	5.0	16.1
15	Lakshadweep	12.6	0.0	12.6
16	Madhya Pradesh	14.0	5.0	19.0
17	Maharashtra	13.9	5.0	18.9
18	Manipur	1.8	0.0	1.8
19	Odisha	15.0	0.0	15.0
20	Puducherry	13.8	2.5	16.3
21	Punjab	12.7	2.5	15.2
22	Rajasthan	13.7	2.5	16.2
23	Tamil Nadu	13.9	5.0	18.9
24	Telangana	12.5	2.5	15.0
25	Tripura	13.6	2.5	16.1
26	Uttar Pradesh	13.7	5.0	18.7
27	Uttarakhand	13.6	0.0	13.6
28	West Bengal	13.3	0.0	13.3

Source: N-LRSI 2019-20, NCAER

Table A7.2: Extent of CM Digitisation

		Scores for digitized RoRs (out of 15)	Legally Usable Copy of RoR (out of 5)	Extent of Digitization of RoR (out of 20)
1	Andhra Pradesh	0.2	2.5	2.7
2	Chhattisgarh	13.2	2.5	15.7
3	Himachal Pradesh	5.4	0.0	5.4
4	Jharkhand	8.6	0.0	8.6
5	Kerala	0.7	0.0	0.7
6	Lakshadweep	11.9	5.0	16.9
7	Madhya Pradesh	11.7	5.0	16.7
8	Maharashtra	7.5	0.0	7.5
9	Odisha	15.0	0.0	15.0
10	Rajasthan	0.8	2.5	3.3
11	Tamil Nadu	6.8	5.0	11.8
12	Telangana	10.0	0.0	10.0
13	Uttar Pradesh	1.5	0.0	1.5
14	West Bengal	11.8	0.0	11.8

Source: N-LRSI 2019-20, NCAER

Table A7.3. Extent of Digitisation of Registration Processes

		Entry of Data (out of 4)	Proportion of villages with digitized CRs (out of 4)	Stamp Duty Payment (out of 4)	Verification of Document by SRO (out of 4)	Delivery of Registered Document (out of 4)	Extent of Digitization of Registration (out of 20)
1	Andaman & Nicobar Islands	0	0	2	0	0	2.0
2	Andhra Pradesh	4	3.6	4	0	2	13.6
3	Assam	0	0	2	0	0	2.0
4	Bihar	0	3.5	2	2	0	7.5
5	Chandigarh	0	0	2	0	2	4.0
6	Chhattisgarh	0	2.7	2	0	0	4.7
7	Dadra & Nagar Haveli	0	0	2	0	0	2.0
8	Daman & Diu	0	0	2	0	0	2.0
9	Delhi	0	0	2	0	0	2.0
10	Goa	4	3.7	0	0	0	7.7
11	Gujarat	0	2.7	2	0	0	4.7
12	Haryana	4	3.8	4	0	0	11.8
13	Himachal Pradesh	0	3.0	2	0	0	5.0
14	Jammu & Kashmir	0	2.3	0	0	0	2.3
15	Jharkhand	4	3.0	2	0	0	9.0
16	Karnataka	4	3.1	2	2	0	11.1
17	Kerala	0	3.5	2	0	0	5.5
18	Madhya Pradesh	4	3.6	4	2	2	15.6
19	Maharashtra	4	3.7	4	2	2	15.7
20	Manipur	4	0	2	2	2	10.0
21	Odisha	0	3.2	4	2	2	11.2
22	Puducherry	0	3.2	2	0	0	5.2
23	Punjab	4	2.8	2	0	2	10.8
24	Rajasthan	4	3.7	4	0	0	11.7
25	Sikkim	0	3.9	0	0	0	3.9
26	Tamil Nadu	4	2.5	4	0	2	12.5
27	Telangana	4	3.3	2	0	0	9.3
28	Tripura	0	0	4	0	0	4.0
29	Uttar Pradesh	4	3.2	2	0	2	11.2
30	Uttarakhand	4	3.6	2	2	2	13.6
31	West Bengal	4	2.9	4	2	2	14.9

Source: N-LRSI 2019-20, NCAER

Table A7.4: Quality of Land Records

		Updating Ownership (out of 5)	Extent of Joint Ownership (out of 10)	Land Use (out of 10)	Land Area (out of 10)	Recording Encumbrances (out of 5)	Total (out of 40)
1	Andaman & Nicobar Islands	0	9.5	0	0	1	10.5
2	Andhra Pradesh	1.3	9.6	0	8.2	2	21.1
3	Assam	1.3	6.3	0	0	2	9.5
4	Bihar	1.3	9.7	0	0	1	12.0
5	Chandigarh	0	0	0	0	2	2.0
6	Chhattisgarh	2.5	9.4	6.5	5	1	24.3
7	Dadra & Nagar Haveli	0	9	0	0	1	10.0
8	Daman & Diu	2.5	9.4	0	0	2	13.9
9	Delhi	0	8.6	0	0	3	11.6
10	Goa	2.5	8.9	0	0	3	14.4
11	Gujarat	2.5	8.4	0	0	3	13.9
12	Haryana	3.8	7.2	0	0	2	12.9
13	Himachal Pradesh	3.8	7	8	1.5	2	22.2
14	Jammu & Kashmir	0	0	0	0	2	2.0
15	Jharkhand	3.8	9.6	9.2	5.6	3	31.2
16	Karnataka	2.5	9.2	0	0	2	13.7
17	Kerala	2.5	0	0	0	2	4.5
18	Ladakh	0	0	0	0	2	2.0
19	Lakshadweep	0	9	0	8.3	1	18.4
20	Madhya Pradesh	2.5	9.2	4.9	5.1	2	23.7
21	Maharashtra	3.8	7.7	8.7	0	3	23.2
22	Manipur	0	9.1	0	0	1	10.1
23	Odisha	1.3	9.2	9.3	5.6	1	26.3
24	Puducherry	0	9.8	0	0	1	10.8
25	Punjab	2.5	9.9	0	0	2	14.4
26	Rajasthan	3.8	8.1	7.1	5.4	1	25.3
27	Sikkim	0	0	0	0	2	2.0
28	Tamil Nadu	3.8	9.4	0	6.6	0	19.8
29	Telangana	2.5	10	7.4	0	1	20.9
30	Tripura	1.3	10	0	0	2	13.3
31	Uttar Pradesh	3.8	8.3	7.9	0	1	20.9
32	Uttarakhand	2.5	5.4	0	0	1	8.9
33	West Bengal	2.5	8.6	7.7	0	3	21.8

Source: N-LRSI 2019-20, NCAER

Table A7.5: Sensitivity Analysis: States/ UTs Rankings for Scenario 1

Ranking	States	N-LRSI Scores
1	Madhya Pradesh	72.3
2	Odisha	67.2
3	Maharashtra	64.0
4	Chhattisgarh	63.6
5	Jharkhand	62.3
6	Tamil Nadu	60.7
7	West Bengal	60.6
8	Rajasthan	57.6
9	Telangana	54.8
10	Andhra Pradesh	53.7
11	Uttar Pradesh	52.2
12	Himachal Pradesh	48.8
13	Lakshadweep	47.5
14	Goa	40.4
15	Karnataka	39.8
16	Punjab	39.8
17	Gujarat	35.0
18	Haryana	34.8
19	Uttarakhand	33.8
20	Tripura	33.3
21	Puducherry	31.4
22	Daman & Diu	30.9
23	Dadra &Nagar Haveli	30.9
24	Bihar	29.0
25	Andaman & Nicobar	25.6
26	Delhi	23.2
27	Manipur	22.5
28	Assam	20.1
29	Kerala	10.8
30	Chandigarh	5.8
31	Sikkim	5.8
32	Jammu & Kashmir	4.4
33	Ladakh	2.5

Source: N-LRSI 2019-20, NCAER

Table A7.6: Sensitivity Analysis: States/ UTs Rankings for Scenario 2

Ranking	States	N-LRSI Scores
1	Madhya Pradesh	76.8
2	Odisha	73.2
3	Chhattisgarh	67.6
4	Tamil Nadu	64.6
5	Maharashtra	64.0
6	West Bengal	61.8
7	Jharkhand	60.6
8	Rajasthan	58.5
9	Telangana	57.6
10	Andhra Pradesh	56.6
11	Uttar Pradesh	52.8
12	Lakshadweep	52.6
13	Himachal Pradesh	47.2
14	Karnataka	39.4
15	Punjab	39.3
16	Goa	38.8
17	Puducherry	34.6
18	Uttarakhand	34.4
19	Dadra &Nagar Haveli	34.1
20	Tripura	33.5
21	Gujarat	32.3
22	Haryana	32.0
23	Bihar	29.8
24	Daman & Diu	28.8
25	Andaman & Nicobar	27.6
26	Manipur	24.0
27	Delhi	21.9
28	Assam	18.3
29	Kerala	6.2
30	Chandigarh	4.0
31	Sikkim	3.9
32	Jammu & Kashmir	2.3
33	Ladakh	0

Source: N-LRSI 2019-20, NCAER

Table A7.7: Sensitivity Analysis: States/ UTs Rankings for Scenario 3

Ranking	States	N-LRSI Scores
1	Madhya Pradesh	70.6
2	Odisha	63.9
3	Maharashtra	62.7
4	Chhattisgarh	59.7
5	West Bengal	57.7
6	Tamil Nadu	57.0
7	Jharkhand	56.7
8	Rajasthan	54.1
9	Telangana	48.9
10	Uttar Pradesh	48.2
11	Andhra Pradesh	48.1
12	Himachal Pradesh	45.6
13	Lakshadweep	41.9
14	Goa	34.2
15	Karnataka	33.2
16	Punjab	32.0
17	Uttarakhand	31.9
18	Haryana	30.1
19	Gujarat	28.5
20	Tripura	24.5
21	Dadra &Nagar Haveli	23.3
22	Puducherry	22.8
23	Daman & Diu	22.3
24	Bihar	19.8
25	Andaman & Nicobar	16.2
26	Delhi	14.5
27	Assam	14.2
28	Manipur	13.1
29	Kerala	12.2
30	Chandigarh	6.7
31	Sikkim	6.6
32	Jammu & Kashmir	5.0
33	Ladakh	2.7

Source: N-LRSI 2019-20, NCAER

Table A7.8: Sensitivity Analysis: States/ UTs Rankings for Scenario 4

Ranking	States	N-LRSI Scores
1	Madhya Pradesh	71.2
2	Odisha	70.8
3	Chhattisgarh	62.7
4	Maharashtra	59.5
5	Jharkhand	57.6
6	Tamil Nadu	56.4
7	Rajasthan	56.0
8	West Bengal	55.5
9	Andhra Pradesh	49.2
10	Telangana	49.2
11	Uttar Pradesh	47.1
12	Lakshadweep	46.2
13	Himachal Pradesh	44.2
14	Uttarakhand	27.2
15	Karnataka	27.2
16	Goa	26.9
17	Punjab	26.0
18	Haryana	22.4
19	Dadra &Nagar Haveli	22.0
20	Puducherry	21.5
21	Gujarat	21.2
22	Tripura	20.1
23	Bihar	16.8
24	Daman & Diu	16.3
25	Andaman & Nicobar	14.9
26	Manipur	11.8
27	Delhi	10.5
28	Assam	9.9
29	Kerala	6.2
30	Chandigarh	4.0
31	Sikkim	3.9
32	Jammu & Kashmir	2.3
33	Ladakh	0

Source: N-LRSI 2019-20, NCAER

Table A8.1: Comprehensive Access Matrix for Online Test Checks

a) Access to Server/Documents and Time Taken

No.	State/ UTs	Ease of Access to Server and Documents			Timing and Time Taken	
		ROR (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	CM (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	CR (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	Average time for ROR	Average time for CM
1	A&N Island	No problem	NA	NA	6.5 (sec)	NA
2	Andhra Pradesh	Repeated attempts 2-4	No problem	No problem	0:40 secs	0:15 secs
4	Bihar	No problem	No problem	No problem	0:20 secs	0:13 secs
6	D&N Haveli	No problem	NA	NA	45 sec	NA
8	Delhi	No problem	NA	NA	8 secs	NA
10	Gujarat	No problem	NA	No problem	26 sec	NA
12	Himachal Pradesh	Repeated attempts 2-4	No problem	No problem	6 secs	6 secs
14	Jharkhand	No problem	Repeated attempts 5-9	No problem	6 secs	9 secs
16	Kerala	Not Accessed	No problem	No problem		15 sec
18	Madhya Pradesh	No problem	No problem	No problem	8.0 (sec)	8.5 (sec)
20	Manipur	No problem	NA	NA	25 secs	NA

Table A8.1: Comprehensive Access Matrix for Online Test Checks

b) Simplicity & Language and User Interface

Simplicity and Language			User Interface				
Is the titles of fields/ records to fill simple/ complex	Is appropriate translation available (Site translation/ Correct Google translation/ Not Available)	Is there a Help/ Frequently Asked Question (FAQ) Tab available on screen to user (Y/N)	What kind of identification is required for accessing the ROR/CM Data (None/Registration using Aadhar or other Identity/ Phone or e-mail without OTP/ Phone or e-mail without with OTP)	Captcha required? (None /Alpha-numeric) Yes/No	Accessibility of RoR Information with basic data (Owner or Identifier No) being entered (Within 4 entries/5-6 entries/7 or more entries)	Accessibility of CM Information with basic data (Owner or Identifier No) being entered (Within 4 entries/5-6 entries/7 or more entries)	Copy Downloadable (Free of cost/ with payment/ not available)
Simple	No Translation	No	None	No	Within 4 entries	NA	Free of cost
Simple	No Translation	No	None	Yes	5-6 entries	5-6 entries	Free of cost
Simple	No Translation	No	None	Yes	5-6 entries	NA	Free of cost
Simple	No Translation	No	None	No	5-6 entries	5-6 entries	Free of cost
Simple	No Translation	Yes	None	No	5-6 entries	5-6 entries	Free of cost
Simple	No Translation	No	None	Yes	5-6 entries	NA	Free of cost
Simple	No Translation	No	None	No	Within 4 entries	NA	Free of cost
Simple	NA	No	None	No	5-6 entries	NA	Free of cost
Simple	No Translation	No	None	Yes	5-6 entries	NA	Free of cost
Complex	No Translation	No	None	Yes	Within 4 entries	NA	Free of cost
Simple	No Translation	No	None	No	5-6 entries	NA	Free of cost
Simple	No Translation	No	None	Yes	7 or more entries	Within 4 entries	Free of cost
NA	No Translation	No	None	NA	NA	NA	NA
Simple	No Translation	No	None	No	7 or more entries	5-6 entries	Free of cost
Simple	No Translation	No	None	No	7 or more entries	NA	Free of cost
Simple	No Translation	No	None	No	NA	Within 4 entries	With Payment
Simple	No Translation	No	None	No	5-6 entries	Within 4 entries	Free of cost
Simple	No Translation	Yes	None	Yes	5-6 entries	5-6 entries	Free of cost
Simple	No Translation	No	Phone no. without OTP	Yes	7 or more entries	5-6 entries	Free of cost
Simple	No Translation	Yes	None	No	5-6 entries	NA	Free of cost

Table A8.1: Comprehensive Access Matrix for Online Test Checks

a) Access to Server/Documents and Time Taken

No.	State/ UTs	Ease of Access to Server and Documents			Timing and Time Taken	
		ROR (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	CM (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	CR (No problem (1)/ Repeated Attempts (2-4)/ Repeated Attempts (5-9) /Not accessed (more than 10)	Average time for ROR	Average time for CM
22	Puducherry	No problem	N/A	No problem	0.15 (Since range of Patta no. is unknown)	N/A
23	Punjab	No problem	NA	No problem	7 sec	NA
24	Rajasthan	Repeated attempts 2-4	No problem	Repeated attempts 2-4	44.78 sec	18.36 sec
25	Sikkim	NA	NA	No problem	NA	NA
26	Tamil Nadu	Repeated attempts 2-4	No problem	No problem	3 secs	3 secs
27	Telangana	No problem	Repeated attempts 2-4	No problem	3.0 (sec)	3.5 (sec)
28	Tripura	No problem	NA	NA	45.7 sec	NA
30	Uttarakhand	No problem	NA	No problem	3	NA
31	West Bengal	No problem	No problem	Repeated attempts 2-4	0:25 secs	0:35 secs

Source: N-LRSI 2019-20, NCAER

Table A8.1: Comprehensive Access Matrix for Online Test Checks

b) Simplicity & Language and User Interface

Simplicity and Language			User Interface				
Is the titles of fields/ records to fill simple/ complex	Is appropriate translation available (Site translation/ Correct Google translation/ Not Available)	Is there a Help/ Frequently Asked Question (FAQ) Tab available on screen to user (Y/N)	What kind of identification is required for accessing the ROR/CM Data (None/Registration using Aadhar or other Identity/ Phone or e-mail without OTP/ Phone or e-mail without with OTP)	Captcha required? (None /Alpha-numeric) Yes/No	Accessibility of RoR Information with basic data (Owner or Identifier No) being entered (Within 4 entries/5-6 entries/7 or more entries)	Accessibility of CM Information with basic data (Owner or Identifier No) being entered (Within 4 entries/5-6 entries/7 or more entries)	Copy Downloadable (Free of cost/ with payment/ not available)
Simple	No Translation	No	None	No	5-6 entries	7 or more entries	Free of cost
Simple	No Translation	No	None	No	5-6 entries	NA	Free of cost
Simple	No Translation	No	None	No	5-6 entries	NA	Free of cost
Complex	No Translation	No	None	No	7 or more entries	7 or more entries	Free of cost
NA	No Translation	No	NA	NA	NA	NA	NA
Simple	Site Translation	No	None	Yes	7 or more entries	7 or more entries	Free of cost
Simple	Site Translation	No	None	No	Within 4 entries	Within 4 entries	Free of cost
Simple	No Translation	No	None	Yes	7 or more entries	NA	Free of cost
Simple	No Translation	No	None	Yes	5-6 entries	Within 4 entries	Free of cost
Simple	No Translation	No	None	No	Within 4 entries	NA	Free of cost
Simple	Site Translation	Yes	None	Yes	5-6 entries	7 or more entries	Free of cost

Source: N-LRSI 2019-20, NCAER

Table A8.2: Access Matrix for Procedural Details in getting to the RoRs Copy

	ROR	DOLR link	Locating the Tab to download document		Administrative Units to be entered		No problem in exhibition of ROR	Land Record Copies		Requirement of CAPTCHA	Requirement of Payment to access records
	States/UTs	✓/✗	Simple	Complex	Only Basic (District, village, tehsil, plot)	Additional units	✓/✗	Downloadable	Read Only	✓/✗	✓/✗
1	A & N Islands	✓	✓			✓	✓	✓		✗	✗
2	Andhra Pradesh	✓	✓		✓		✓	✓		✓	✗
3	Assam	✓	✓		✓		✓		✓	✓	✗
4	Bihar	✓		✓		✓	✓	✓		✗	✗
5	Chhattisgarh	✓	✓		✓		✓	✓		✗	✗
6	D & N Haveli	✓	✓			✓	✓	✓		✓	✗
7	Daman & Diu	✓	✓			✓	✓	✓		✗	✗
8	Delhi	✓	✓			✓	✓	✓		✗	✗
9	Goa	✗	✓		✓		✓	✓		✓	✗
10	Gujarat	✓		✓	✓		✓	✓		✓	✗
11	Haryana	✓	✓			✓	✗	✓		✗	✗
12	Himachal Pradesh	✗	✓			✓	✓	✓		✓	✗
13	Jharkhand	✓	✓			✓	✓	✓		✗	✗
14	Karnataka	✗	✓			✓	✓	✓		✗	✗
15	Kerala		✗	✓	✓		✗	NA		✗	✓
16	Lakshadweep	✓	✓			✓	✓	✓		✗	✗
17	Madhya Pradesh	✓	✓			✓	✓	✓		✗	✗
18	Maharashtra	✓	✓		✓		✗	✓		✓	✓
19	Manipur	✓	✓			✓	✓	✓		✗	✗
20	Odisha	✓	✓		✓		✓	✓		✗	✗
21	Puducherry	✓	✓		✓		✓	✓		✗	✗
22	Punjab	✓	✓			✓	✓	✓		✗	✗
23	Rajasthan	✓	✓			✓	✓	✓		✗	✗
24	Tamil Nadu	✓	✓		✓		✓	✓		✓	✗
25	Telangana	✓	✓			✓	✓	✓		✗	✗
26	Tripura	✓		✓		✓	✓		✓	✓	✗
27	Uttar Pradesh	✓	✓		✓		✓	✓		✓	✗
28	Uttarakhand	✓	✓		✓		✓	✓		✗	✗
29	West Bengal	✓	✓		✓		✓	✓		✓	✗

Source: N-LRSI 2019-20, NCAER and State/UT sources

Table A8.3: Access Matrix for Procedural Details in getting to the CMs Copy

	ROR	DOLR link	Locating the Tab to download document		Administrative Units to be entered		No problem in exhibition of ROR	Land Record Copies		Requirement of CAPTCHA	Requirement of Payment to access records
	States/UTs	✓/✗	Simple	Complex	Basic	Additional units	✓/✗	Downloadable	Read Only	✓/✗	✓/✗
1	Andhra Pradesh	✓	✓		✓		✓	✓		✗	✗
2	Assam	✓	NA		NA		NA	NA		NA	✗
3	Bihar	✓	✓			✓	✓	✓		✗	✗
4	Chhattisgarh	✓	✓			✓	✓	✓		✗	✗
5	Himachal Pradesh	✓	✓		✓		✗	✓		✗	✗
6	Jharkhand	✓	✓			✓	✓	✓		✗	✗
7	Kerala	✗	✓		✓		✗	NA		✓	✓
8	Lakshadweep	✓	✓			✓	✓	✓		✗	✗
9	Madhya Pradesh	✓	✓			✓	✓	✓		✗	✗
10	Maharashtra	✓	✓		✓		✓	✓		✗	✗
11	Odisha	✓	✓			✓	✓	✓		✗	✗
12	Rajasthan	✓		✓		✓	✓	✓		✗	✗
13	Tamil Nadu	✗	✓		✓		✓	✓		✓	✗
14	Telangana	✗	✓		✓		✓	✓		✗	✗
15	Uttar Pradesh	✓	✓		✓		✓	✓		✗	✗
16	West Bengal	✗		✓		✓	✓		✓	✗	✗

Source: N-LRSI 2019-20, NCAER

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NCAER India Centre, 11 Indraprastha Estate, New Delhi 110 002, India
Tel: +91 11 23452657, 61202698
info@ncaer.org, www.ncaer.org