

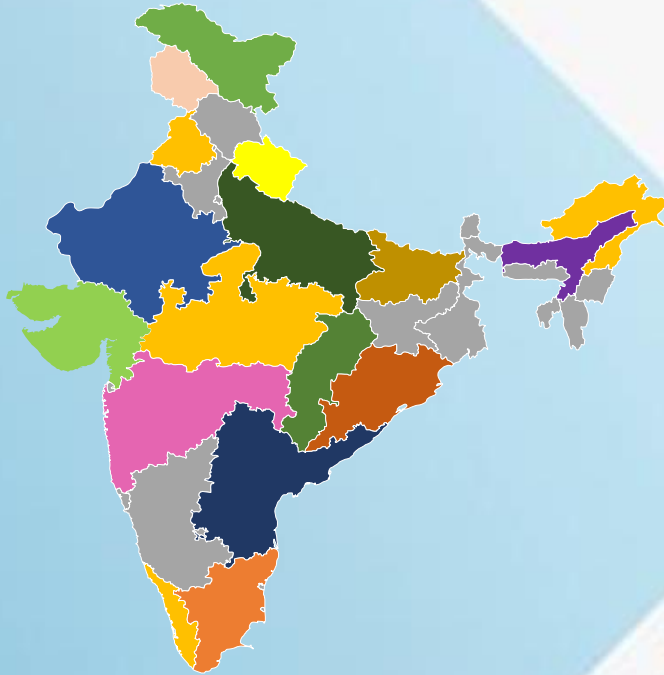


GOVERNMENT OF INDIA  
DEPARTMENT OF LAND RESOURCES  
MINISTRY OF RURAL DEVELOPMENT



UN-GGIM  
UNITED NATIONS  
COMMITTEE OF EXPERTS ON  
GLOBAL GEOSPATIAL  
INFORMATION MANAGEMENT

# Regional Seminar on “Effective Land Administration & Management: An INDIAN Context”



Kunal Satyarthi  
Joint Secretary  
Government of India

26<sup>th</sup> November, 2024  
Bharat Mandapam, New Delhi, India

# Land Records and Digitization: FACTS

---

Land - ***finite natural resource*** – Main source of livelihood, pride, emotions and socio-economic value and the only asset for most citizens

---

Welfare services & benefits of ***government schemes*** primarily depend on land records

---

To avail ***services/benefits*** based on land rights and for transaction of land (Sale/purchase/mutation etc.) a prospector has to **visit various offices/ numerous times**

---

**Inter-sectoral/ departmental/ services *significance***  
(Revenue, Registration, Banks, Courts etc.)

# Land Records and Digitization: FACTS (Contd.)

Land Administration and management is ***diverse*** - language, culture, regions, topography, nomenclature, measurement, formats

Land and its management fall in the ***domain of the States***, Central Government is implementing DILRMP (financial and technical support) (Entry Nos. 18 and 45 in **State List of Constitution of India**)

***Digitisation of land records*** with accurate and updated information and its easy online access to the public (Ease of living and Ease of business)

**Single source of authentic information** about land (encumbrances, disputes etc) is required



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# Past to Present

DILRMP is extended to Urban Areas for creating Land Records

NAKSHA Pilot 2024  
Urban Habitations  
Land Records

SVAMITVA  
2021  
For Rural Habitations

100% Central  
Funding

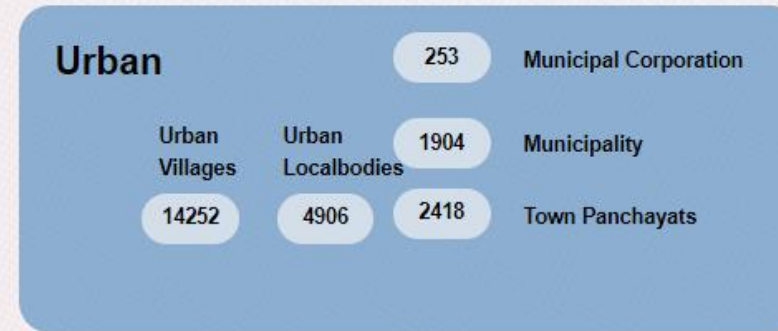
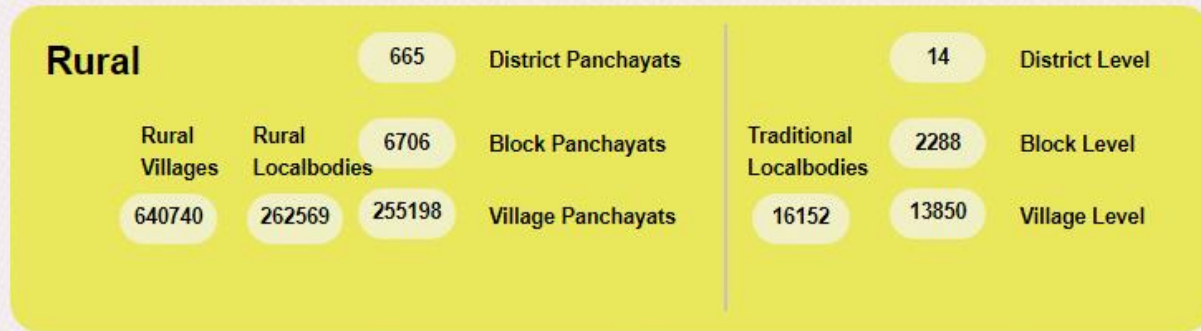
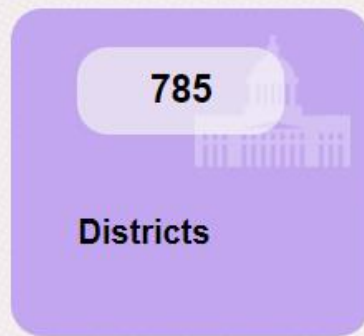
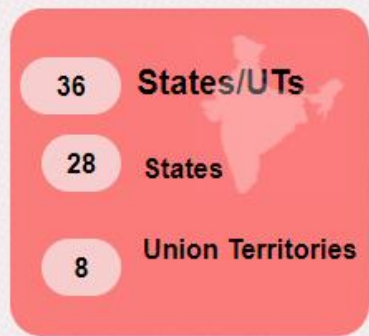
DILRMP  
2016  
For Rural Agricultural

2008-09  
Upgradation of Land  
Records(ULR)  
NLRMP

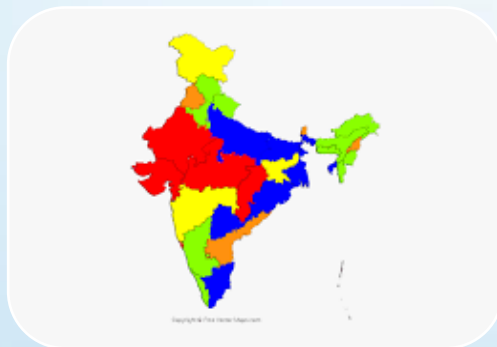
After  
Independence  
1947

British Period

Asymmetrical  
Land  
Management  
System



Source: <https://lgdirectory.gov.in/>



**Geographic Area :**  
3.28 Million sq.km



**Population :**  
1.4 Billion



**GDP : \$3.73 trillion**  
(Apx)



**Federal Structure:**



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# Digital India Land Records Modernization Programme (DILRMP)

## Years of implementation (2021-26)

- Covers all rural agricultural land in villages across the Country
- Financial Outlay- Rs. 875 crores (Rs. 8,750 Million)



Nodal Department GoI	Nodal Department at States	Technology Partner
Department of Land Resources	Revenue Department	National Informatics Centre (NIC)



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# Major Components of DILRMP





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# Digital India Land Records Modernization Programme (DILRMP)



95%

Computerization of  
Record of Rights  
(RoRs)



94.9%

Computerization of  
Registration



87.6%

Integration of SROs  
with Land Records



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# Digital India Land Records Modernization Programme (DILRMP)



83.4%

Digitization of  
Cadastral Maps



85.66%

Modern Record  
Rooms

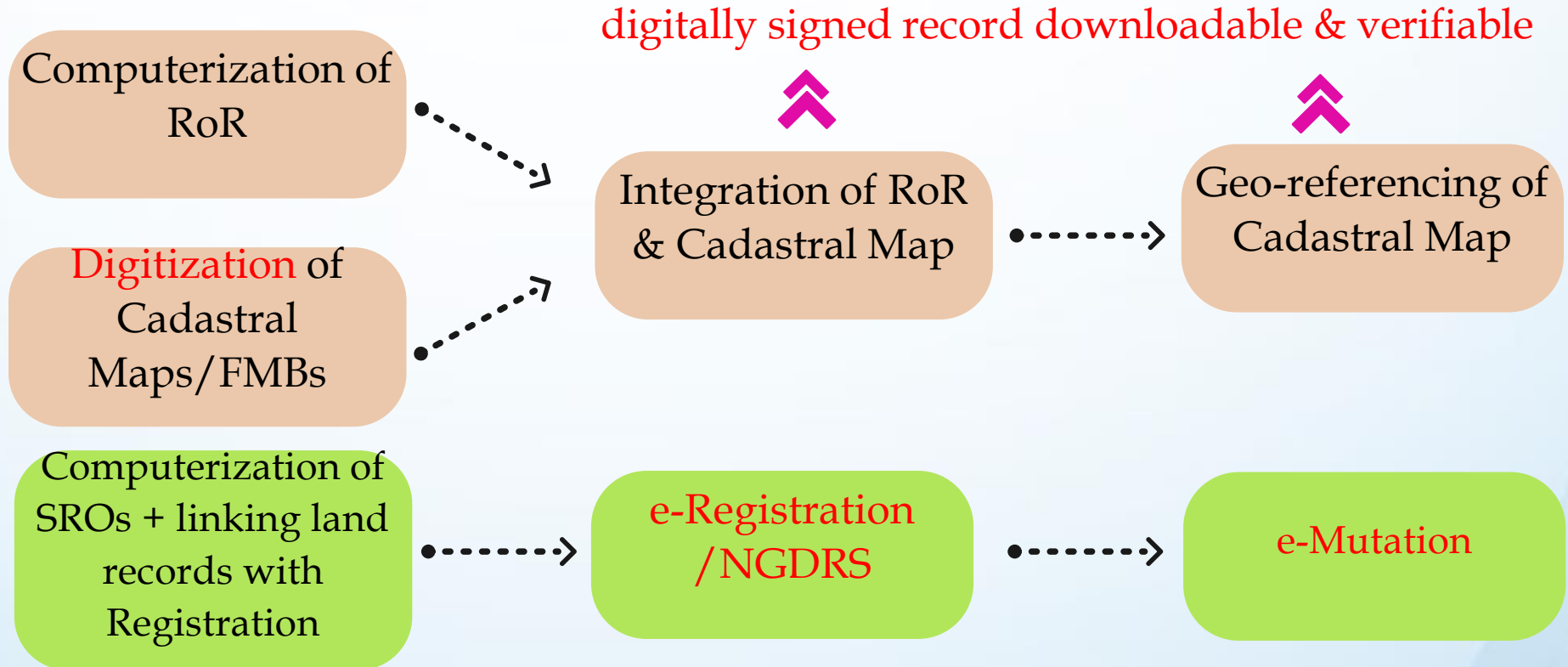


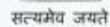
63.5%

Issuance of  
Digitally signed  
RoRs

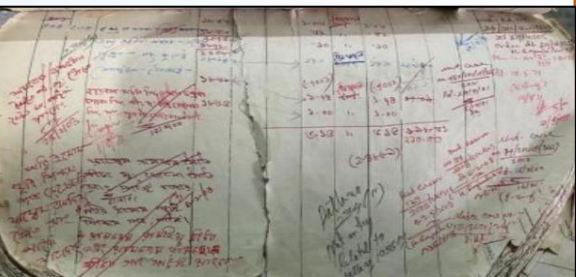
# Stages of Land Records Digitization & Registration

Generation of Bhū-Aadhar  
or ULPIN



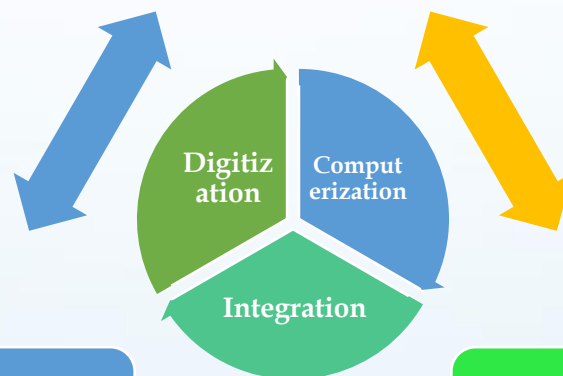


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[illegible]

# Integration Process

# Registration Offices



# Land Records

# Mutation

## (Revenue Courts )

## E-Courts

# Blockchain

# Computerized

### Online/ Availability

## Paper less/ Transparency

# Faceless



# Bhu-Aadhar or Unique Land Parcel Identification Number (ULPIN)

- **14 digit Alpha-Numeric** Unique ID for each land parcel
- Based on **geo-coordinates of vertices** of land parcel
- **Standardization**, Tracking of all land transactions
- Ease in Governance: Seamless sharing and **Cross validation of land records**
- Utility across Sectors/ Agencies/ Authorities/courts
- Enables **multi service delivery**





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# Bhu-Aadhar or Unique Land Parcel Identification Number (ULPIN)

Rolled Out

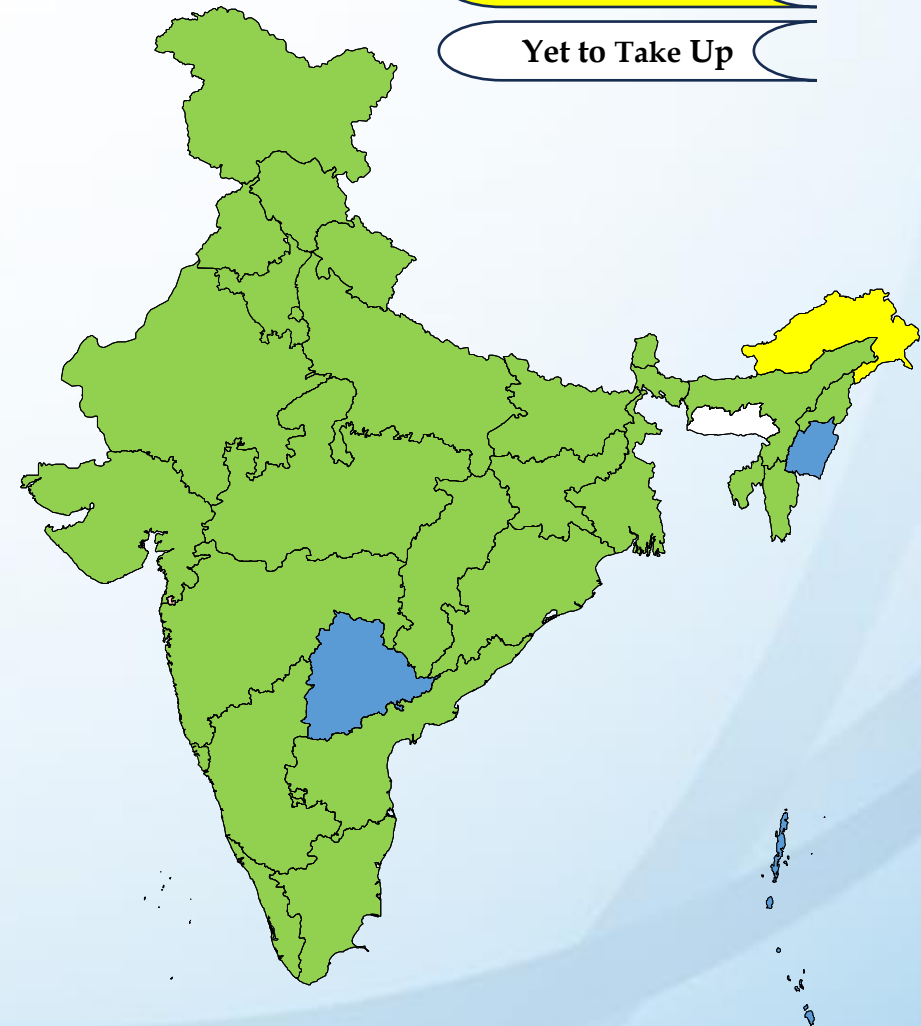
Pilot

Under Process

Yet to Take Up

- **149+ Million** Bhu-Aadhaar assigned
- **29 States/UTs** have adopted Bhu-Aadhar or ULPIN

Status	States/UTs	Total Nos.
Rolled Out	Andhra Pradesh, Jharkhand, Goa, Bihar, Odisha, Sikkim, Gujarat, Maharashtra, Rajasthan, Haryana, Tripura, Chhattisgarh, Jammu & Kashmir, Assam, Madhya Pradesh, Nagaland, Mizoram, <b>Tamil Nadu</b> , Punjab, Dadra and Nagar Haveli & Daman and Diu, Himachal Pradesh, West Bengal, Uttar Pradesh, Uttarakhand, Kerala, Ladakh, Chandigarh, Karnataka and Delhi	29
Pilot	Puducherry, Andaman & Nicobar, Manipur, Telangana	4
Under Process	Arunachal Pradesh	1
Yet to Take Up	Meghalaya and Lakshadweep	2





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# E-Registration or National Generic Document Registration System (NGDRS)

Rolled Out

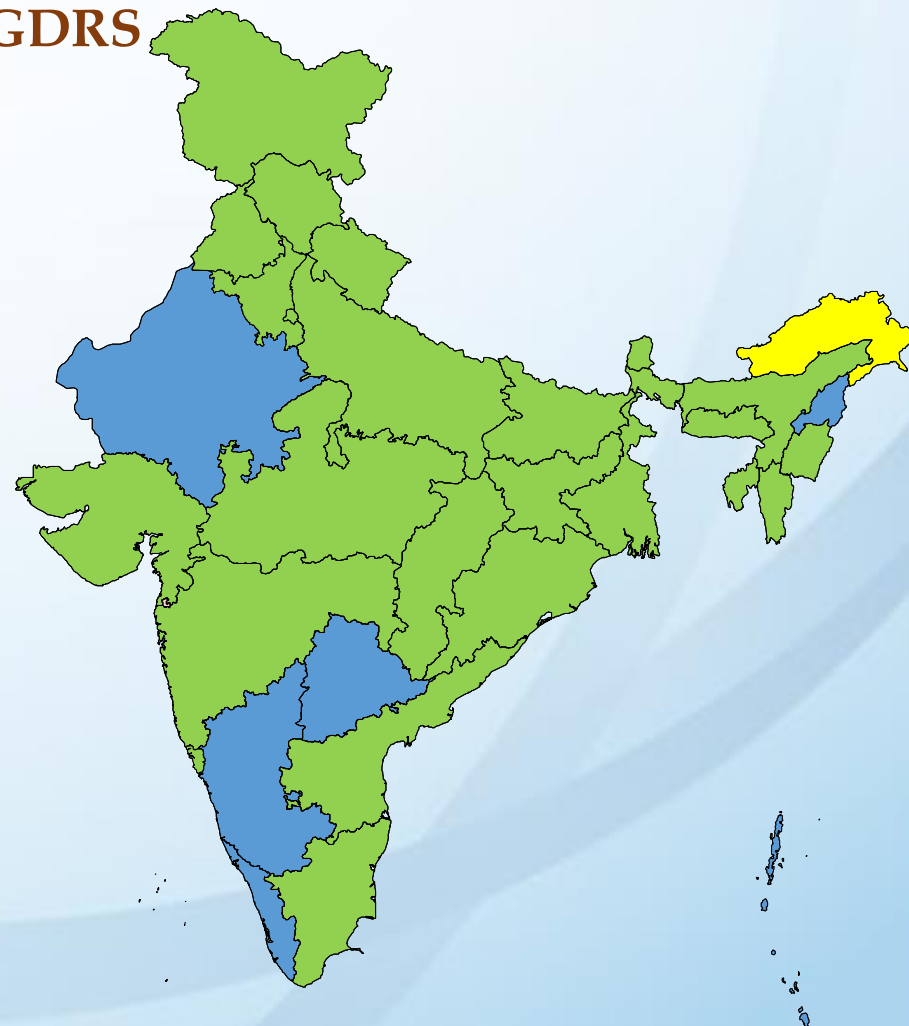
Pilot

Yet to Adopt



**30** States/UTs have adopted the NGDRS/Linked with NGDRS

Status	States/UTs	Total Nos.
Rolled Out	Andaman & Nicobar Island, Goa, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Ladakh, Punjab, Tripura, Maharashtra, Mizoram, DNH & DD, Manipur, Assam, Bihar, Chhattisgarh, Meghalaya and Uttarakhand	30
Linked with NGDRS	Andhra Pradesh, Haryana, Chandigarh, NCT Delhi, Gujarat, Madhya Pradesh, Odisha, Sikkim, Tamil Nadu, Uttar Pradesh, Puducherry, Telangana and West Bengal have started sharing registration related data with national portal of NGDRS- <a href="http://www.ngdrs.gov.in">www.ngdrs.gov.in</a> through API /UI	
Under Process	Arunachal Pradesh	1
Yet to Adopt	Rajasthan, Karnataka, Lakshadweep, Nagaland and Kerala	5





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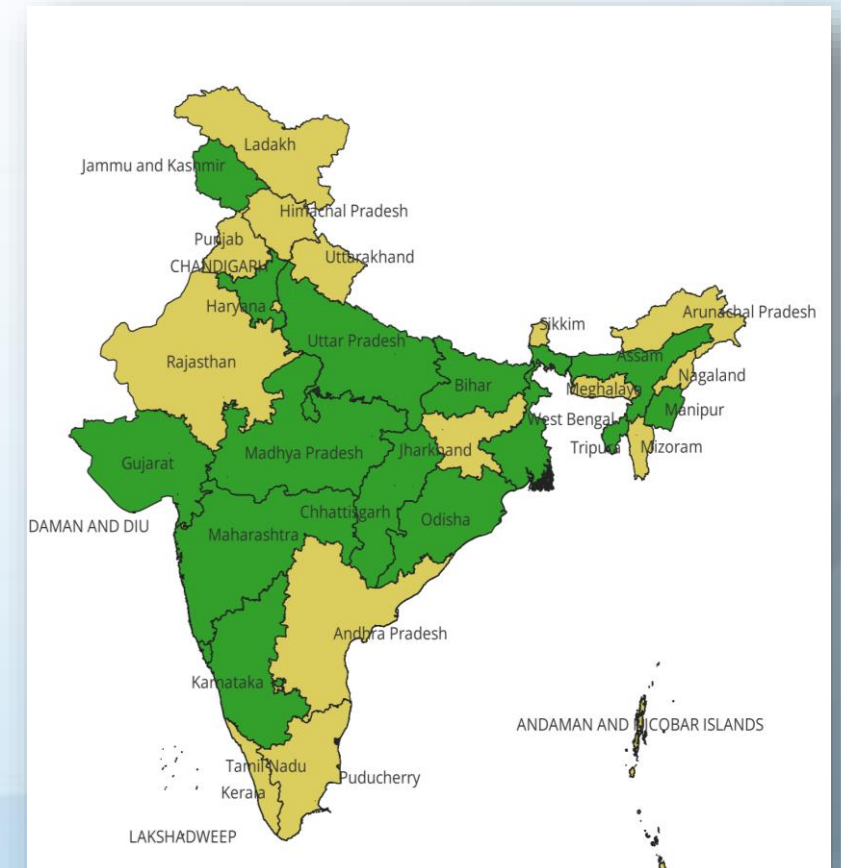
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# Transliteration of Land Records to break linguistic barriers

Transliteration tool is available on the respective websites on land records of **17 States/UTs** viz. Assam, Bihar, Chandigarh, Chhattisgarh, Goa, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Odisha, Puducherry, Tripura, UP, West Bengal and J&K

Link of the State / UT websites are given below:

State	URL
J&K	<a href="https://landrecords.jk.gov.in/Reports/JMReport">https://landrecords.jk.gov.in/Reports/JMReport</a>
Maharashtra	<a href="https://bhulekh.mahabhumi.gov.in">https://bhulekh.mahabhumi.gov.in</a>
Gujarat	<a href="https://anyror.gujarat.gov.in">https://anyror.gujarat.gov.in</a>
Bihar	<a href="http://biharbhumi.bihar.gov.in/Biharbhumi/">http://biharbhumi.bihar.gov.in/Biharbhumi/</a>
Puducherry	<a href="https://nilamagal.py.gov.in/">https://nilamagal.py.gov.in/</a>
Haryana	<a href="https://jamabandi.nic.in/land%20records/NakalRecord.aspx">https://jamabandi.nic.in/land%20records/NakalRecord.aspx</a>
Goa	<a href="https://dslr.goa.gov.in/">https://dslr.goa.gov.in/</a>
Chandigarh	<a href="https://revenue.chd.gov.in/Nakal.aspx">https://revenue.chd.gov.in/Nakal.aspx</a>
UP	<a href="https://upbhulekh.gov.in/public/public_ror/Public_ROR.jsp">https://upbhulekh.gov.in/public/public_ror/Public_ROR.jsp</a> <a href="https://upbhulekh.gov.in/public/public_ror/Public_ROR_Ansh_new.japani">https://upbhulekh.gov.in/public/public_ror/Public_ROR_Ansh_new.japani</a>
MP	<a href="https://mpbhulekh.gov.in">https://mpbhulekh.gov.in</a>
Tripura	<a href="https://jami.tripura.gov.in/EODB/citizen_search.aspx">https://jami.tripura.gov.in/EODB/citizen_search.aspx</a>
Chhattisgarh	<a href="https://bhuiyan.cg.nic.in">https://bhuiyan.cg.nic.in</a>





भूमि संसाधन विभाग  
DEPARTMENT OF  
LAND RESOURCES

# NAtional geospatial Knowledge-based land Survey of urban HAbitations (NAKSHA)

*Creating Land Records In Urban Areas*



Department of Land Resources

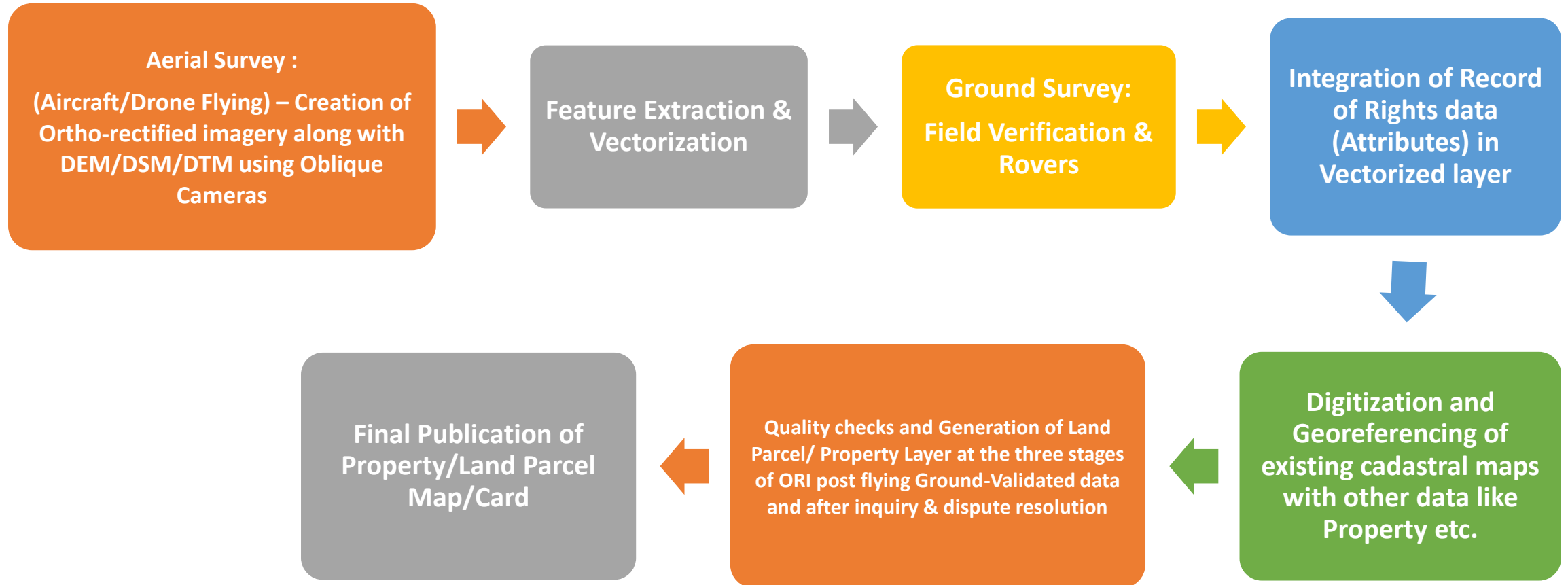
# NAKSHA PILOT PROGRAMME (2024-25)

**NAKSHA** aims to provide the 'Land Records' in urban areas and issuance of Urban Land Records to the owners.

- to ensure that urban land records are accurate and up-to-date
  - empowering urban citizens, improving ease of living
  - enabling better property tax collection, utilities, disaster management & urban planning
  - Creation of WebGIS infrastructure
- 
- Covers more than **150 ULBs** in the Country
  - Financial Outlay- Rs.193.8 crores (**Rs. 1,938 Million**)

Nodal Ministry, GOI	Nodal Department at States	Technology Partner
Department of Land Resources	Revenue / Urban Development/ Local Self Government Department	Survey of India

# NAKSHA: Flow chart





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# NAKSHA: Methodology

Aerial Survey

1

2D **Nadir** Camera with 2D feature extraction

2

**Oblique** angle camera **(5 cameras)** and data acquisition for creation of 3D reality Model and creation of 3D GIS dataset

3

**Oblique** angle camera **(5 cameras)** with **LiDAR Sensor** for creation of 3D reality Model and creation of 3D GIS dataset



पंचायती राज मंत्रालय  
भारत सरकार

Ministry of Panchayati Raj  
Government of India

# स्वामित्व SVAMITVA

(Survey of Villages and Mapping with  
Improved Technology in Village Areas)

**Survey of **V**illages **A**nd  
**M**apping with  
**I**mproved **T**echnology  
in **V**illage **A**reas  
(**SVAMITVA**)**



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# SVAMITVA SCHEME

**SVAMITVA** aims to provide the 'Record of Rights' to village household owners in rural abadi areas and issuance of Property cards

Nodal Ministry	Nodal Department at States	Technology Partner
Ministry of Panchayati Raj	Revenue Department/ Panchayati Raj Department	Survey of India

## Scheme (FY 2020-25)

- Covers all eligible inhabited villages across the Country
- Establishment of 567 CORS network
- Financial Outlay- 566.23 crores ( Rs. 5,662 Million)
  - Creation of accurate land records
  - Creation of survey infrastructure and GIS maps





# Continuously Operating Reference Stations (CORS)



**Pan India CORS services launched – August 2023**

<https://cors.surveyofindia.gov.in/>

## User Statistics



5684 Registered Users  
12 Million + Hours Data

## Merging of



CORS infrastructure  
established by other  
agencies with National  
Network

Densification of the  
CORS Network is  
under process,  
especially in the  
urban and hilly  
areas.

CORS Network - 1042 stations  
established by Survey of India



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# Drone Based Survey in Rural Areas

*SVAMITVA Programme of Govt. of India*

Based on the very high-resolution Ortho-rectified images generated from the Drone survey, property parcels are digitized and Record of Rights are issued in the rural inhabited areas.



**Creation  
of  
accurate  
land  
records**



**Enabling  
the  
Citizens  
to use  
their  
property  
as a  
financial  
asset**



**Decision  
on  
Property  
Tax**



**Creation of  
Survey  
Infrastructur  
e and GIS  
maps**



**Support  
Gram  
Panchayat  
Development  
Plan (GPDP)**





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# Drone Based Survey in Rural Areas

*SVAMITVA Programme of Govt. of India*

## Project Implementation Work Flow



**MoU signing between  
SOI and State**



**Gram Sabha & IEC activities**



**Marking of Properties**



**Ground Control Points**



**Drone Survey**



**Data Processing &  
Feature Extraction**



**Objection Process/Dispute  
Resolution**



**Property Card Distribution**



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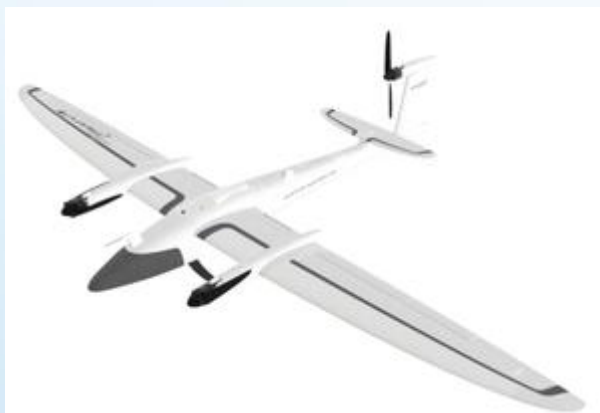
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# Drone Based Survey in Rural Areas

*SVAMITVA Programme of Govt. of India*



**Quadcopter**



**Fixed Wing with VTOL  
capability**

**400 + SoI Drones**

**100 + Drone as a Service**

**Every Minute an SoI Drone takes  
off**

**300, 000 + villages completed**

**160,000,000 + images**

**4 PB + Geospatial Data Generated**



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# Drone Based Survey in Rural Areas

*SVAMITVA Programme of Govt. of India*



Inhouse data Processing



100+ high end/Mid-level systems  
No of images  $\approx$  500-1000 per village  
Data size  $\approx$  5 GB per village



Processing on cloud



Data transfer from Field to Office

- Physical transfer or online
- Direct uploaded on to the cloud



# Challenges

- Survey / Resurvey methodology and Technology
- Mismatch between traditional & new measurement
- Community land ownership in North East States
- Non-Availability of the surveying and digitization expertise (agencies) locally
- Requirement of highly skilled manpower, specially IT/GIS professionals
- Long gestation period, voluminous work, time consuming processes
- Lack of Network Support and low bandwidth



# Way Forward

- **Citizen Centric** Approach and Public Engagement
- Simplification and **revisit of regulations**
- IEC, Training, Incentivization and Capacity Building
- **Saturation of digitization & georeferencing**
- Focus on georeferencing and second & third generation reforms like e-Registration, Bhu-Aadhaar or ULPIN, Transliteration & Translation of LR and GIS based Land Governance
- Technology based solutions (AI/ML) and effective public service delivery
- **Conclusive titling and de-materialization of land & property**
- Strong connectivity infrastructure
- **Whole of Government and Role based approach**
- **Minimum Government, Maximum Governance**



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# Thank You

for any queries reach:

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[kunalsatyarthi@gmail.com](mailto:kunalsatyarthi@gmail.com)

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