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Embracing Technology for Land Records: A Reformative Leap

The foundation for verifying title of land lies in the examination of land records, which contain essential information such as landholder, type of holding, location, area, encumbrances, etc. However, the conventional paper-based maintenance of these records proves arduous, leading to errors and hindrances in determining the title of land with clarity. To address these challenges and propel the modernization of land record management, digitization emerges as a pivotal solution. By leveraging technology, digitization aims to mitigate land and property disputes, foster transparency in record-keeping, and pave the path towards establishing unequivocal land titles nationwide.

In India, vide chain of documents, known as Record of Rights ("**RoR"**), the transfer of title can be traced from one individual to another over time, culminating in the current owner(s)/holder(s). The custodians of these land records are the revenue department, vested with the authority to maintain meticulous land record details. Additionally, various transactions pertaining to ownership changes, such as sales, loans, mortgages, and crop updates, are sanctioned by revenue department officials, leading to updates in the RoR. Governed by state laws, the land records system facilitates the mutation of land, encompassing alterations in ownership, cultivators, crops, irrigation sources, and associated rights and obligations. The RoR is of paramount importance especially for farmers, enabling them to access government subsidies for seeds, fertilizers, loans, and sales.

India has embraced various technological initiatives to move from traditional paper based systems to digital systems to enable ease of transactions, credibility of records and reduction of frauds.

Digital India Land Records Modernization Programme ("DILRMP")[1]:

In our diverse nation, marked by a rich tapestry of languages, cultures, regions, and socio-economic dynamics, the digitization of land records stands out as a vital undertaking. This transformation aims to ensure accuracy, updated status, and easy public access to land records, acknowledging the complexities inherent in land administration and management. While the responsibility for land and its management primarily lies with the states, the Government of India has been actively supporting states and union territories both, financially and technically, to digitize land records and make them accessible to the public.

The Digital India Land Records Modernization Programme ("**DILRMP**"), launched in 2016, represents a significant step towards modernizing land record management. It builds upon the earlier National Land Records Modernization Programme ("**NILRMP**"), transitioning into a centrally funded scheme with a renewed focus on leveraging technology to minimize land disputes, enhance transparency, and streamline land records maintenance. The recent extension

[1] Source: DILRMP | DEPARTMENT OF LAND RESOURCES | India (dolr.gov.in)

of the scheme by the Ministry of Finance underscores its continued importance, with added components like the computerization of revenue courts and Aadhaar linkage with RoR further enhancing its scope.

Seamless access to land records information is vital for improving the efficiency and effectiveness of services provided by central and state government departments. The development of an integrated land information management system is essential for driving infrastructure development, economic growth, and ensuring the livelihoods of the rural population, which heavily relies on land resources. DILRMP, with its focus on adopting modern technologies such as AI, Machine Learning, and Blockchain, aims to establish a comprehensive and transparent land record management system. This system promises error-free, transparent, and tamper-proof land records, thereby securing rights for citizens, reducing land disputes, simplifying property title transfers, and aiding in policy and planning initiatives.

Despite the complexity and voluminous nature of the implementation process, substantial progress has been made in key components of the programme, including the computerization of Record of Rights, digitization of cadastral maps, registration processes, and integration of registration and land records. This progress underscores the program's commitment to modernizing land administration and its potential to bring about transformative change in the management of land records. Physical progress under major components of DILRMP is available on https://dilrmp.gov.in/

Government Initiatives:

a) Unique Land Parcel Identification Number or Bhu-Aadhar[2]

The Unique Land Parcel Identification Number ("**ULPIN**") is a cornerstone of the DILRMP. It consists of a 14-digit identifier assigned to each land parcel, derived from its longitude and latitude coordinates, meticulously mapped through detailed surveys and geo-referenced cadastral maps. Serving as a singular, authoritative source of truth, ULPIN offers comprehensive information on any land parcel or property, facilitating integrated land services for citizens and stakeholders alike.

Built upon international standards, including those set by the Electronic Commerce Code Management Association ("**ECCMA**") and the Open Geospatial Consortium (**"OGC"**), the ULPIN system ensures reliability and compatibility across platforms. Its benefits extend beyond mere land details, playing a pivotal role in various government initiatives such as insurance and disaster assistance. For instance, during a recent natural calamity in Maharashtra, where landholder KYC verification was crucial for aid distribution, ULPIN facilitated a

[2] Year End Review 2023: Achievement of the Department of Land Resources (Ministry of Rural Development) | Ministry of Rural Development | Government of India

streamlined process through mobile OTP-based verification, circumventing cumbersome paperwork procedures and delay in aid distribution.

b) **National Generic Document Registration System**[3]:

The National Generic Document Registration System ("**NGDRS**"), spearheaded by the Department of Land Resources under the Ministry of Rural Development, Government of India, is a versatile application designed to streamline document registration processes across the country. This user-friendly platform caters to sub-registrars, citizens, and apex users within registration departments, offering a standardized yet adaptable framework.

NGDRS empowers states to create customized instances tailored to their specific requirements, enhancing flexibility and efficiency. With a comprehensive user interface, the application facilitates seamless property and document registration, empowering citizens to engage in online land transactions. Users can access vital information such as circle rates, property valuation, and land type, aiding informed decision-making. Moreover, NGDRS imposes restrictions on transactions involving prohibited properties such as government land, tribal land, and mortgaged land, ensuring compliance with legal regulations and avoidance of fraudulent/illegal transactions. This feature assists buyers in selecting suitable properties aligned with their preferences and legal constraints.

By enabling online document submission, instant payments, appointment scheduling, and property valuation, NGDRS minimizes the need for multiple visits to the sub-registrar's office, saving time and resources for both citizens and department staff. This streamlined workflow not only benefits citizens but also enhances the productivity of departmental personnel, ultimately fostering a more efficient and transparent registration process.

c) Linkage of E-Court with Land Record and Registration data base[4]

The E-courts Project, an integral component of the National e-Governance initiatives, has been operational in Courts across the nation since 2007. Its primary objective is to furnish courts with essential hardware and software tools, facilitating the provision of e-services. Moreover, it empowers the judiciary to oversee and administer court operations effectively.

E-Court serves as a platform for citizens, litigants, lawyers, government bodies, and law enforcement agencies to access comprehensive data and information pertaining to the country's judicial framework. The objective of linking E-Court with the Land Record and Registration database is to furnish courts with authentic and firsthand information, thereby expediting case resolution and ultimately reducing land disputes. The benefits of this linkage include:

[3] Supra 2
[4] Source: Press Information Bureau (pib.gov.in)

1. Providing courts with first-hand information on substantive and authentic evidence from the RoR, Cadastral maps, includsing geo-referenced and legacy data. This empowers courts to make well-informed decisions during case proceedings.

2. Facilitating the admission and disposal of disputes by providing courts with comprehensive information crucial for case resolution.

3. Contributing to a reduction in the number of land disputes nationwide, fostering an environment conducive to business operations and promoting ease of living.

Successful pilot tests for the linkage of E-Court with land records and registration databases have been conducted in three states namely, Haryana, Maharashtra, and Uttar Pradesh. These initiatives, conducted in collaboration with the Department of Justice, represent a significant step towards leveraging technology to streamline legal processes and enhance the administration of justice.

d) Transliteration of Land Records in all languages of Schedule VIII in all States/UTs:[5]

India's linguistic diversity presents significant challenges in accessing/understanding land records, which are mostly maintained in local languages across states and union territories. This linguistic barrier poses challenges for individuals seeking information and understanding of land governance. To address this issue, the Department of Land Resources (**"DoLR"**), with technical assistance from the Centre for Development of Advanced Computing (**"C-DAC"**) Pune, has launched an initiative to transliterate Records of Rights from local languages to any of the 22 languages listed in Schedule VIII of the Constitution.

During the budget announcement for the fiscal year 2022-23, the Honourable Finance Minister highlighted the rollout of the transliteration facility for land records across Schedule VIII languages. Seventeen states and union territories, including Assam, Bihar, Chandigarh, Chhattisgarh, Goa, Maharashtra, Madhya Pradesh, Manipur, Odisha, Gujarat, Haryana, Karnataka, Puducherry, Uttar Pradesh, Tripura, West Bengal, and the Union Territory of Jammu & Kashmir, have enabled their systems with transliteration software.

This initiative aims to enhance accessibility and understanding of land records by making them available in multiple languages. Capacity building and training for officers and officials of all 26 states and union territories have been provided by C-DAC Pune, ensuring effective implementation of the transliteration process. By transcending linguistic barriers, this initiative facilitates broader access to land governance information and promotes transparency in land administration across diverse linguistic regions of India.

[5] Source: Press Information Bureau (pib.gov.in)

e) Use of Blockchain in Land Records:[6]

In light of cases related to fraudulent manipulation of land records, safeguarding the integrity of the database is paramount. This is achieved through the adoption of blockchain technology, which employs cryptographic techniques to guarantee data security. In this system, each block incorporates its unique data along with the hash of the preceding block, creating an interlinked structure that renders any unauthorized alterations virtually unfeasible. As a result, blockchain technology ensures the permanence and inviolability of recorded information, offering a robust defence against tampering or unauthorized access.

For land records, accurate storage in the blockchain is essential. The historical transactions related to a piece of land must be inserted into the blockchain after approval by revenue authorities in the state. Once approved, this data is digitally signed and stored, serving as the foundation for any future mutations. Further, certificates issued by the Revenue Department are also stored in the blockchain, enabling other agencies such as banks to verify information during land transactions. Transactions like change of ownership, sales, loans, mortgages, and crop updates initiated by various departments undergo verification using blockchain data. Upon approval of these transactions, details are stored in the blockchain, ensuring transparency and security.

Additionally, during the sale process, the registration department will fetch details from the blockchain based on the survey number to verify ownership before initiating the sale. After obtaining signatures from the buyer and seller on the sale deed, the scanned document is moved into the blockchain network to create a block. Once created, this block cannot be edited or tampered with, forming a chain of blocks that chronicle the property's ownership changes over time.

f) GIS Mapping[7]:

Survey of India (**"SoI"**), the national mapping agency (**"NMA"**) of the country under the Ministry of Science & Technology, is embarking on an innovative initiative to enhance mapping activities using advanced technology. By leveraging professional-grade drones for large-scale Mapping, SoI aims to streamline mapping processes and improve efficiency.

The presence of litigation related to land boundaries and access roads often complicates the establishment of clear land titles. However, through GIS data preparation and drone surveys, these challenges can be addressed effectively. Drone surveys will play a crucial role in accurately determining the locations of village boundaries, canals, agriculture field limits, and roads, thereby facilitating the establishment of clear land titles.

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[6] Source: https://blockchain.gov.in/Home/CaseStudy?CaseStudy=LandRegistration

[7] Source: Survey of India using new technologies for mapping and data generation | Department Of Science & Technology (dst.gov.in)

This initiative benefits prospective purchasers by providing them with easy access to information regarding land boundaries and area, enabling them to make informed decisions about land ownership. Additionally, landholders can utilize this technology to confirm their possession and identify any encroachments on their land, thereby mitigating potential future issues.

Challenges, Impact and way ahead:

In the realm of real estate, there are notable hurdles, such as legal disputes over land, instances of multiple sales, and a lack of reliable mechanisms to authenticate land records. The conventional system grapples with issues of trustworthiness and accuracy, struggling to keep pace with the escalating number of land transactions. In response, the government has enacted various initiatives, including the Digital India Land Records Modernization Programme (DILRMP), aimed at modernizing land record management.

Today, with the help of modern technology and as a result of several government initiatives as mentioned above, individuals can effortlessly access digitally signed land records, historical data with respect to change in ownership/rights, village maps with accurate boundaries, litigation records, and details of transactions registered in the office of registrar of assurances, in multiple languages thereby simplifying land ownership verification and ensuring the title of land to be foolproof.

This digital transformation has revamped the land record system, eradicating inaccuracies, fraud, and manual errors associated with traditional record-keeping methods. It furnishes precise and timely information on land ownership, transactions, boundaries, and encumbrances, fostering transparency and accountability in land administration.

Additionally, in the near future, we can keep track of on ground alterations by using satellite imaging, AI and GPS. Recently, Centre of Excellence on Satellite & Unmanned Remote Vehicle Initiative (**"CoE-SURVEI"**) has developed an Artificial Intelligence-based software which can automatically detect change on ground, including unauthorised constructions and encroachments in a time series using Satellite Imagery.

The CoE-SURVEI, established by Directorate General Defence Estates at National Institute of Defence Estates Management, leverages latest technologies in survey viz. satellite imagery, drone imagery and geo-spatial tools for effective land management and urban planning.[8] Nonetheless, there remains a necessity for public education and awareness to harness these systems effectively and fulfil their intended objectives. Moreover, government agencies must fortify digital infrastructure to meet rising service demands and ensure the provision of accurate information crucial for verifying land titles and associated particulars.

[8] Source: pib.gov.in/PressReleaseIframePage.aspx?PRID=1839200

Embracing technological advancements holds the potential to significantly enhance transparency, efficiency, and confidence in land governance within the real estate sector. This, in turn, not only benefits landowners but also expedites transactions, streamlines land acquisition processes, and accelerates project development.

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