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Tech-Enabled Transparency: A New Era for Land Acquisition and Resettlement

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ABSTRACT

Starting from the evolution of the systems of land acquisition, rehabilitation and resettlement, this Article then dwells upon how the PNA Act of 2013 has transformed the said processes and the role technology can play in making them efficient, fair and transparent. After drawing a broad outline of the current scenario of land acquisition in India, this Article specifically looks at the use, role, potential and challenges the applications of Geographic Information Systems, blockchain, smart mobile applications, etc, can play in refining the process of land acquisition. The Article further discusses the major hurdles that need to be overcome/considered in this regard: the digital divide, apprehension regarding the data security and the need incumbent upon the legislature to amend the existing statutes to incorporate the technological solutions. The Article concludes with providing recommendations for policy reforms in the form of revising and amending the PNA Act of 2013 by extending provisions to encourage the use of these technologies, enacting specific statutes pertaining to technology and land acquisition, initiatives for digital literacy in rural masses in particular and spreading awareness in general and public-private partnerships for developing technological solutions.

Keywords*: Land Acquisition, Rehabilitation, Resettlement, Geographic Information Systems (GIS), India.*

I. INTRODUCTION

In India, land acquisition, rehabilitation and resettlement (LARR) has always been a complex and contested subject, representing the dichotomous conflict between the forces of development and the rights of project-affected people. Its roots are in the independent era of the country in the 1940s and '50s. The Land Acquisition Act of 1894, legislated during the colonial era, served as legal mumbo jumbo for many decades, and allowed Indian industry and developmentalists to practice a colonial ethos. The 1894 Act was criticized for its emphasis on speeding up the acquisition of land for commercial projects, irrigation schemes and industry, often at the

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 [ISSN 2581-5369]

expense of the moral and legal rights of displaced communities.

The biggest problems with land acquisition relate to the process of moving people once their land and/or resources have been taken from them ('rehabilitation') and to physically moving them from their original residences to a new location ('resettlement'). The problems related to land acquisition are compounded by the fact that India has several unique patterns of land use with very different rural and urban contexts and densities.

To rectify injustice, the Government of India introduced the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act), that shifted the process of acquisition in favor of landowners and other affected parties, seeking to make the process more transparent, provide just compensation, and mandated greater effort towards rehabilitation and resettlement.

Its most important provisions included: an SIA for all projects; consent of a minimum percentage of the families affected (in non-public projects); and, higher compensation up to four times the market price for free land (four to eight times the market price in rural areas) and two times the market price for non-free land (three to six times the market price in urban areas); the necessity of an RTP, with rehabilitation and resettlement guidelines from the center and the local level; employment, housing and provision of basic infrastructural amenities in the resettlement area; and mandatory training for all DRAs to ensure that they were capable of managing the programme.

Yet in recent years, technological innovations have begun to change the nature of the LARR process. Digital tools and platforms are offering new ways to record, disseminate and share information and consult with affected communities. They can help to monitor compliance with legal requirements. Geospatial applications, for example, have been employed to map land parcels and record their size and ownership, helping to identify households affected, to estimate their likely demographic impacts, and to plan resettlement sites more accurately and inclusively.

Also, the ledger provided by blockchain technology could be useful to help with land registration procedures, which could also reduce incidences of land title fraud and thus the integrity of the compensation transactions. Mobile apps and online platforms help with two-way communication and provide feedback mechanisms between the project authority, affected population and government departments which, in turn, enables greater involvement of affected populations in LARR.

 [ISSN 2581-5369]

II. Legislative framework in India

While the rules for land acquisition seem relatively straightforward today, India's legal regime for land has its roots in the colonial period and has been governed predominantly by the coercive British-enacted Land Acquisition Act of 1894 which was designed to enable the British government to acquire land for the general public purpose, in particular the construction of railways and related infrastructure that would further interests of colonial government. The 1894 Act was often described as being skewed in favor of the government, permitting it to pressure landowners to relinquish property rights without sufficient and appropriate compensation for affected communities. And so, the process began wherein the state's development interests were allowed to trump individual property interests, and this trend continued.

After India's independence in 1947, a major overhaul that balanced the demands of citizens' interests and rights to acquire land for 'public purpose' shifted the focus away from maximizing the revenue or financial returns from land. The democratic government too began a series of land reforms including redistributing land to the landless and compensation policies. The 1894 Land Acquisition Act remained largely intact for several decades, meaning that many of the inefficiencies and injustices of the colonial state continued for several more decades. Subsequent amendments dealt with one issue or another of land acquisition, but a comprehensive overhaul of the Act would not come for decades, till the 21st century.

(A) The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013

In its second avatar – as the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 – it ushered in one of the most radical changes to a legal regime governing land acquisition anywhere in the world. The Act, 2013 brought in the requirement of a Social Impact Assessment of projects displacing more than 50 families; the need for obtaining consent from 70 to 80 per cent of displaced land owners for projects of the private sector and those under public private partnership (PPP), respectively; and to compensate farmers between four and two times the market value in rural and urban land respectively.

The basic tenor of the Act, 2013 is that a plan should be evolved to ensure that acquisition of land for development purposes becomes just, fair, systematic and transparent, with minimum displacement and maximum resettlement and rehabilitation. The intent is that there should be a balance between the need to acquire land to serve public purposes and respect for the right of owners of land, with adequate compensation, holding and resettlement and rehabilitation of

 [ISSN 2581-5369]

those who are displaced and deprived of their livelihood.

Despite good intentions, the Act, 201 has never struck a good balance – either between the right of displaced people to decent homes, compensation and livelihoods, nor between the imperatives of development and economic justice – and, at times, the interests of displaced people clashed directly with imperatives of development, once such land became valuable for large infrastructural and industrial projects. On this argument, the Act – even as it is invoked in the name of protecting those to whom it grants rights – makes land acquisition so difficult and tedious in practice that crucial development projects are stymied. Second, compensation rates do not adequately correspond to the changing realities of their economic lives, nor are rehabilitation and resettlement processes coordinated and efficient.

III. ROLE OF THE JUDICIARY IN SHAPING LAND ACQUISITION POLICIES

Indian judges also played a defining role in interpreting and evolving policy on land acquisition. Courts with staggering names – *Bhopal Gas Peedith Mahila Udyog Sangathan v. Union of India* – changed the terms of compensation. The Supreme Court concluded that land acquisition would 'continue to be a favored mode' if accompanied by procedures to determine 'thoroughly, in every aspect, what a person is entitled to', 'fairly ascertain the value of the land', and 'do justice to the property concerned'.

Some judicial interpretations have gone further than legislation to broaden the scope of compensation and transparency. Courts have increasingly extended the concepts of compensation and transparency to the social and economic dislocation of the affected, not just the payment of the wet market price for the land being taken. In another formulation that positions compensation as part of a broader vision of justice, courts have moved toward speaking of 'just compensation', a term that can include compensation for lost livelihoods and social displacement.

The steady evolution of land acquisition laws in India, from its colonial-era Land Acquisition Act, 1894 to the largely new Act, 2013, not only indicating important changes in the judiciary interpretations of the laws over time, but also demonstrates the conscious and affirmative movement towards promoting greater fairness, transparency and justice for those whose land is being acquired for the larger public interest, reveals the mindset that promotes balancing of the interests and needs of development with the rights and interests of the people in the development process.

 [ISSN 2581-5369]

IV. THE ROLE OF TECHNOLOGY IN ENHANCING TRANSPARENCY AND FAIRNESS

Technology brings a complete change to land acquisition and resettlement, bringing transparency and fairness in the sector. The increased application of technology in land acquisition and resettlement process has numerous advantages, like better accuracy of land records, increased efficiency in processing and engaging participants.

(A) Current Technological Interventions

GIS platforms aid in the maintenance and analysis of land records – serve as the most advanced digital record of ownership of physical features present within a geographic region and the ownership of those land parcels. This function is critical to the successful and efficient planning and execution of land acquisition or resettlement projects. For example, a GIS can help parse administration, tax revenue, cadaster and environmental data across the landscape, help to identify adjacent land owners, and can even include encroachment data to account for illegal dwellings and infrastructure on land owned by a government.

Blockchain for Land Records

Blockchain registers the previous user, the time and date of the transaction, and records the transfer of the land to the next user The most compelling use for blockchain is to maintain a secure, immutable ledger of users' land transactions over a peer-to-peer network of computers, making blockchain well-suited to maintaining a land record. By preventing tampering of typed land transaction data, blockchain should reduce the incidence of fraud, dispute and corruption over land acquisition. A blockchain will also create a more transparent, verifiable record of landowners and the transaction data. In many cases, land is small, and ownership is itself contested and imperfectly delineated, which has implications for how one values land and hence for the calculation of compensation, resettlement and the overall fairness of an acquisition.

Mobile Applications for Stakeholder Engagement

Mobile apps allow project authorities, government bodies and affected communities to stay in touch and engage with one another in real-time by sharing information, grievances or feedback. For example, they can be used to share updates about project developments, compensation or resettlement, or for public and private consultations during the early planning stages of a project.

(B) Benefits of Technology-Enabled Transparency

Using technology – in particular, GIS (geographical information systems) and blockchain – to enhance accuracy of land records digitizes and securely records data on land, reducing discrepancies and errors in land titles and ownership details, so that compensation and

 [ISSN 2581-5369]

resettlement are based on indisputable, precise data..

Enhanced Public Access to Information

Technology increases access to relevant data about specific land acquisition projects, including compensation and resettlement plans. Websites, online portals and mobile applications make information accessible on a large and diverse group of stakeholders for easy access and sharing. With an abundance of information at hand, the process becomes more transparent and is more readily accepted by stakeholders, particularly the affected groups. This ensures their broader participation in various stages of the process.

Streamlined Compensation and Resettlement Processes

Technological interventions help ensure compensation and resettlement arrangements are more efficient and timelier. Automated systems for compensation claims, blockchain-based transaction records, and digital platforms for resettlement planning will cut through bureaucratic delays and enhance the responsiveness of the relevant authorities. This will help to speed up project timelines, as well as to improve community satisfaction and trust.

(C) Case Studies

One of the examples of transparency facilitated by technology was in India where geographic information systems (GIS) were informed by villagers and used in the Narmada Valley Project for resettlement and rehabilitation information systems. GIS was used to identify suitable resettlement sites and to guide the reciprocal transfer of land from displaced families, thereby increasing the fairness and transparency of the process.

Another example is the implementation of blockchains for land records in the state of Andhra Pradesh, which endeavors to create secure records for city properties and townships. A pivotal aspect of its effectiveness is making these records open and free from tampering – given that India is one of the most litigious countries in the world where land disputes are rampant, this initiative could help alleviate some of that, therefore enhancing the speed of the land acquisition process.

International Examples of Technology in Land Acquisition

Likewise, in national settings, countries such as Rwanda have leveraged technology to modernize their land registration and administration systems. Rwanda's Land Tenure Regularization Program mapped and registered land tenure rights using GIS and satellite imagery, thereby increasing tenure security and improving the efficiency of land transactions.

Similarly, GIS and electronic land registration systems have been relied on in South Korea to

 [ISSN 2581-5369]

conduct land acquisition and resettlement that have opened up ground for mass, large-scale urban development and infrastructure, and all this done with remarkable public trust and trustworthiness.

And as these case studies suggest, when harnessed by policymakers and regulators, technological solutions can help to make the process of land acquisition – and the difficult task of resettlement – more open and fairer to everyone involved. The key change is that technology enables a shift to tech-enabled solutions that solves a real problem. We've come a long way.

(D) Challenges and Barriers

The use of technology to instill norms of transparency and fairness in land acquisition and resettlement is propelled by its transformational nature, but made complicated by a different set of constraints: technological deficiencies and legal and regulatory impediments that limit the efficacy and transformative potential of tech-enabled transparency and fairness in land acquisition and resettlement.

a. Technological Limitations and Challenges

Digital Divide and Accessibility Issues

One of the major issues in making use of digital technologies in land acquisition and resettlement is the digital divide. The massive gap in the distribution of digital technologies and the internet between urban and rural, rich and poor, young and old in India needs to be seriously considered while delivering the promises of technological interventions. Rural areas, where the bulk of land acquisition for developmental projects takes place, have poor access to digital technologies and internet services. These socio-economic barriers deny stakeholders, whose lives have been affected by one development or another, access to stakeholder meeting platforms on the web, and also the flow of information regarding government schemes and grievance-redressal mechanisms. Illiteracy, or lack of digital literacy, adds to the misery of these groups.

Data Privacy and Security Concerns

And this increasing application of technology raises significant data privacy and security concerns too, since sensitive information is collected, processed and stored in systems that manage land records, process compensation payments, and register beneficiaries and provide LRA or RAP details. Evidence of land ownership, the amount of compensation due to the affected people, bank details and other personal identifying details all need to be stored with high standards of cybersecurity to prevent breaches of data and instances of access by

 [ISSN 2581-5369]

unauthorized third parties and fraud. Without robust data protection laws and regulations in place, the potential abuse of sensitive data is an important concern. If digital land acquisition and resettlement is to promote trust and the rights of citizens, we must ensure that data is handled in an auditable and secure way.

b. Legal and Regulatory Hurdles

Compatibility of Current Laws with Technological Advancements

Another legal challenge for technology-enabled practices in land acquisition and resettlement relates to incompatibilities between existing laws and technological solutions. Many legal frameworks, especially property laws and registration acts, were drafted in a pre-digital era and do not sufficiently take account of the nuances of tech-enabled solutions. For example, official sanctioning of digital documents, electronic signatures and blockchain-based land records requires amendments to the existing property laws and registration acts. The incompatibility between traditional legal frameworks and modern technological tools can result in slow or absent adoption of technology-enabled practices in land acquisition and resettlement.

Need for Regulatory Frameworks for Tech-based Solutions

Given the dearth of specific regulatory frameworks on land acquisition and resettlement, one of the most important challenges in this area relates to the use of technology. Given that digital technologies like GIS, blockchain and mobile applications have become essential to most land deals, especially when they involve natural resources, substantial regulations are urgently needed to define standards, guidelines and ethical considerations when using technologies for any land acquisition or dealing process. It is vitally important to ensure adequate protection of personal data and to provide secure storage for such data that, if lost, would compromise the rights of all those affected. Issues related to access and the accurate representation of information by tech-based solutions also require regulation. Accountability and transparency of such solutions will depend on their deployment according to well-established regulations and the willingness of the technology providers and users to disclose their use. Recourse mechanisms in the event of technology use failures or misuse will also need to be regulated.

This highlights that the challenges of the powerful but fragile tech-legal ecosystem for land acquisition and resettlement are ultimately about finding sanctuary between the resilience to slow technological change within ministries, firms and the legal profession and the ability to rapidly assimilate which entails a long-term vision of change and a dedicated effort by policymakers, technologists, lawyers and communities. Technical hurdles in relation to land tech create a space where bipartisan effort is called for to shape technology in a way that only

 [ISSN 2581-5369]

a multi-disciplinary response can address. It also calls for the accommodation of law and legal language by evolving technologies but also by the political will to embrace technology in the name of greater openness, participation and inclusion.

V. POLICY RECOMMENDATIONS AND THE WAY FORWARD

The role of technology in providing more transparent and equitable arrangements during land acquisition and resettlement has positive potential but, to be able to attain this potential, a mixed layers of interventions are required from a legal perspective, technological means and an international level. In this section I set the floor with some expected policies, which would facilitate a path toward ensuring that the positive potential of technology in land acquisition and resettlement can be harnessed to achieve equitable results.

Amendments to the 2013 Act to Incorporate Technology

The RFCTLARR Act, or Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, is a progressive and significant step to ensure fairness in land acquisition processes. Amending the Act to explicitly recognize and facilitate the use of digital technologies, including field technologies like Geographic Information Systems (GIS), blockchain technology for land records and mobile apps for stakeholders, could enable utilization of these advanced tools for transparency, accuracy and efficiency in land acquisition processes. Crucial areas of progress must be addressed through these amendments, particularly relating to data literacy, privacy and security.

Specific Laws for the Use of Technology in Land Acquisition Processes

Besides amending existing laws, there is a need for laws specifically dedicated to the pipeline of technologies associated with land acquisition and resettlement. Such laws would specify the standards, protocols and ethical norms for bringing the technology to bear on actual uses, and could address issues such as data integrity, access, inclusion, meaningful participation, grievance redress and so on. Dedicated legal structures specific to tech-enabled land acquisition processes would both clarify and bring confidence to the stakeholders, allowing procedures to be implemented and adopted more smoothly.

Government Initiatives for Digital Literacy

Critical to overcoming the digital divide – and to ensure that technological interventions are broad-based and inclusive – are large investments in digital literacy. Governments should embark on national programmes to improve digital literacy across the population, particularly in the countryside and in underserved constituencies. These programmes should aim to build

 [ISSN 2581-5369]

digital literacy and skills among citizens so they can engage meaningfully in the land acquisition and resettlement processes. Such programmes can be integrated into other educational and community programmes that connect existing points of civic engagement such as schools, community centers or local government institutions to serve as hubs for digital literacy.

Public-Private Partnerships to Develop and Implement Technology Solutions

These technologies are best developed and deployed together with technology manufacturers, startups, commercial partners, and universities to leverage private-sector expertise, innovation and financing needed to complement existing approaches to land acquisition and resettlement. For instance, PPPs would support governments in developing land-tenure technologies that are scalable and sustainable like blockchain-based registers of rights, GIS mapping or even mobile apps for stakeholder engagement and outreach. Likewise, aside from technological fixes, PPPs would support governments in building the technological infrastructures – such as internet infrastructure and dedicated data-centers – necessary to make these fixes workable at scale.

VI. Conclusion

What would have been considered praiseworthy ten years ago, or so, could now be categorized as mere cooperation as this section makes clear, the discourse surrounding land acquisition and resettlement in India is increasingly – albeit slowly – progressing along new routes. The shift from a predominantly colonial-centric view (state taking precedence over landowners, paying compensation as it saw fit) towards a more humane and normalized procedure that ensures progressive transparency and fairness is of profound significance, not just in the policy space, but also in India's social psyche (where the latter usually follows the former, though there could be exceptions to the rule). Advanced digital tools such as Geographic Information Systems (GIS), blockchain and mobile applications can further revolutionize it, opening up doors to efficiency and fairness.

Technology has markedly changed the nature of acquiring land by making land records more accurate and acquisition processes efficient. GIS, or geographical information systems, helps in better planning and execution of land acquisition by providing maps with administrative, tax, revenue, cadaster and environmental data. This helps in identifying legal owners, estimating demographic effects, and planning rehabilitation sites more accurately. Another way in which technology can make land acquisition transparent and efficient is using blockchain technology, which can serve as a recording system for secure, tamper-proof records of land transactions. This can increase trust and integrity of compensation transactions and curb fraud and possible disputes to a great extent.

 [ISSN 2581-5369]

While such technologies are not without their problems (e.g., digital divide – large gaps between people's access of digital technologies; very common in rural areas where most land is acquired for development; often the affected community cannot meaningfully participate in the resettlement process; also, lacks access to important information and grievance redressal processes; data privacy and security – these issues are coming to fore as more and more sensitive data gets digitized).

Legal and regulatory regimes are only just playing catch-up with these evolving capabilities: unlike the technologies they aim to support, many still have a foot in a pre-digital world. Inertia in the law leads to bottlenecks in the implementation of tech-enabled practices; existing tech can extend into new areas before regulatory frameworks are properly considered and debated. The relationship between technology and law is unfolding in real time and is one of the greatest legacy challenges of the 21st century: comprehensive legal reform is needed to lock in these capabilities. But the implications of these reforms are far-reaching. From telerehabilitation and prenatal scans to the market for goods and services – all of these are trying to find the right place within the system. We intend to build the rules of the road.

However, these challenges mean that finding the right solutions requires a multi-stakeholder, multi-disciplinary approach led by individuals from the state, the private sector, the law, and civil society, and affected communities. Amendments to the Act, 2013 that include explicit recognition and encouragement of digital technologies would be a good place to start. More detailed laws that frame the use of digital technologies in land acquisition could be a step further in laying out what standards, protocols and ethics should be in place.

Moreover, the government should also take a leading role in efforts to improve digital literacy, in particular in rural and disadvantaged communities. National programmes dedicated to training and equipping citizens with basic digital skills could help to address the digital divide, while better enabling citizens to participate in the processes that impact them. In this way, collaboration between the private sector and the public sector could also play a meaningful role, with each contributing their expertise and resources towards developing scalable, sustainable technology approaches.

To conclude, while the use of technology in land acquisition and resettlement offers the potential for greater transparency and fairness, the realization of this potential remains a task that must be tackled urgently, requiring a concerted effort to overcome the existing technological, legal and educational barriers that stand in its way. By creating the opportunity for technological solutions to be embedded organically within legal frameworks, and for the

 [ISSN 2581-5369]

capacity to access and engage with technology to be distributed more equitably among citizens, the land acquisition processes in India will not only be more efficient and fairer, but also more inclusive and just. Such an emancipatory development paradigm that offers a valuable balance between the needs of development projects and the rights and wellbeing of people impacted will be well on its way.

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 [ISSN 2581-5369]

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