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Keywords: Land Governance; World Bank; Digital Transformation; Punjab; Clrmis; Arazi Record Centers (Arcs); Public Service Delivery; E-Governance; Institutional Reform; Transparency.

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This paper analyzes the World Bank–funded Computerization of Land Records Management and Information Systems (CLRMIS) project in Punjab, Pakistan, which aimed to overhaul the corrupt Patwari system. With a budget of $45.5 million, the project introduced a centralized digital land database, biometric verification, and over 150 Arazi Record Centers (ARCs). These reforms improved administrative efficiency, reduced transaction costs and time, and enhanced public trust in land services. The creation of the Punjab Land Records Authority (PLRA), along with supporting legislative reforms, further bolstered institutional capacity. While issues such as digital illiteracy and infrastructure gaps persist, the project stands as a model for e-governance in developing countries, with implications extending beyond land rights toward broader institutional transparency.

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Contents

Introduction

Secure and open land administration is the backbone of social cohesion, economic prosperity, and safeguarding of property rights. In developing nations, however, land administration systems are most typically plagued by systemic inefficiencies, Opacity, and entrenched patronage networks. Punjab, Pakistan's largest province, has long been dependent on the Patwari system, an antiquated, manual system of land recordation tracing its roots back to colonial times (Hashmi, 2021). It was opaque, corrupt, and discretionary, leading to endless tension, false transactions, and limiting access to reliable ownership data, especially in marginalized and rural societies.

Realizing these challenges, the Punjab Government, with the support of the World Bank, started the Computerization of Land Records Management and Information Systems (CLRMIS) project in 2007 (Ahsan et al., 2025). This far-reaching change sought to reshape the province from an unfocused, paper-based system to an up-to-date, coordinated computerized land administration system. Behind this project lay the strategic engagement of the World Bank, a deep financial commitment (USD 45.5 million through an IDA credit), and significant technical input. The project was not merely a technological innovation but a systemic transformation of public service delivery, institutional accountability, and state-citizen relations in the land sector.

World Bank inputs extended far beyond money. It helped to develop a secure, central electronic database; counseled on incorporating biometric authentication to forestall fraud; and ensured planning and implementation of standardized service facilities called Arazi Record Centers (ARCs). They were opened in all districts of Punjab to deliver clean, effective, and accessible services like granting documents of land ownership (fard), mutation of property, and registration of inheritance (Tassadiq, 2024). The Bank also served as a catalyst for institutional reform by facilitating the establishment of the Punjab Land Records Authority (PLRA), a professional, independent agency with responsibility for maintaining and developing the digital land infrastructure.

The process of reform entailed complex legal and regulatory reforms to materially accept electronic records, rationalize processes, and embed responsibility mechanisms (Mahama, Rana, Marjoribanks, & Elbashir, 2022). Even though the project was resisted by conventional stakeholders and faced challenges of digital literacy and rural infrastructure, the overall effect of the project was revolutionary in character. Service delivery times were significantly curtailed, corruption windows were reduced, and public trust in land administration was significantly enhanced.

This article undertakes a critical examination of the World Bank's multi-faceted participation in the digital upgrading of the Punjab state's land records system. It discusses the fiscal, technical, legal, and institutional aspects of the CLRMIS project, examines its performance in terms of enhancing transparency and governance, and explores its wider implications for land reform and digital government within the realm of developing environments.

Research Question

- How has the World Bank improved land governance in Punjab through digitalization?

Literature Review

The article "Digitalization of Land Records and Its Impact on General Public Through E-Registration: A Study of E-Registration / Sub-Registrar Offices District Faisalabad" (2025) by Mubbasher Siddiq, Muzaffar Qadir Malik, Muhammad Usman Zafar, Dr. Hassan Tariq, and Dr. Muhammad Iqbal Zafar explores how land record digitalization impacts public experience, satisfaction, and trust in service delivery. In line with a quantitative survey of 500 participants from Faisalabad, the research documents that digitalization contributes notably to transparency, information access, and citizen satisfaction. More important variables positively linked to public impact were perceived usefulness, ease of use, and accountability, whereas socio-economic variables like education and computer literacy impacted user perceptions. Statistical tests (Chi-square test and Gamma tests) verified robust digital system-service outcome linkages. The authors conclude that digital land systems provide real governance advantages, but the leverage depends on awareness, inclusivity, and facilitation through infrastructure. The research yields useful ground-level information to guide wider policy action for digital and institutional government transformation in Pakistan (Siddiq, Malik, Zafar, Tariq, & Zafar, 2025).

The article "Impact of the Land Record Management Information System (LRMIS) on land-related corruption in government administration and management departments: A quasi-natural experiment. *Pakistan Institute of Development Economics (PIDE)*" (2025) by Saqib Hussain investigates the effect of Land Record Management Information System (LRMIS) on land-related corruption in government administrative and management offices as a quasi-natural experiment. By adopting mixed methods on the one hand, observing administrative data, and on the other hand, interviewing, the analysis assesses Punjab's World Bank–financed digitization of land records. Evidence shows that the LRMIS had a significant diminishing effect on storage channels for manipulation, forgery, and bribery in real estate deals, supported by a measurable decline in accompanying court cases. The e-platform elevated the transparency of records, standardized processes, and integrated biometric verification, reestablishing citizen confidence in land administration. However, challenges, as noted by Hussain, are rural outreach weaknesses, digital

literacy levels, and weaknesses in infrastructure. The research finds that although LRMIS has indeed improved transparency and minimized corruption, its ultimate success lies in institutional sustainability assistance, publicity campaigns, and infrastructure capacity strengthening. This empirical study significantly substantiates the case for digital governance reform in land administration in the Global South (Hussain, 2025).

The paper "The Impact of Digitization on Legal Systems in Developing Countries" (Djuraev et al., 2025) printed in the Quba Han Academic Journal reviews the influence of new technologies mainly blockchain and smart contracts on legal systems in seven developing countries (India, Kenya, Brazil, Rwanda, South Africa, the Philippines, and Ghana). On the basis of a mixed-methods design incorporating qualitative interviews and quantitative analysis of legal reform implementation, the research shows that digitization is effective in eliminating backlogs of cases, increasing transparency, and streamlining judicial processes. In particular, the research elucidates how blockchain technology guarantees the integrity of legal documents by creating documents that cannot be altered, and how smart contracts ease contract automation and enforcement, with concomitant cost savings and efficiency gains. Significantly, writers also identify critical implementation issues like uneven digital infrastructure, cybersecurity threats, and digital literacy gaps, most pronounced in rural and remote regions, and highlighting the need for participatory, capacity-building interventions. This research adds to the wider literature on digital governance and land administration in the observation that technological innovation holds promise only with supportive policy environments, investment in infrastructure, and person-centered approaches to implementation. The authors promote roll-outs on a phased basis and incorporate that such efficiency and public trust gains depend on equal access, and therefore, the book becomes a key point of reference in understanding digitization-driven change in legal and administrative regimes across the Global South (Djuraev et al., 2025).

Methodology

The research employs a qualitative, interpretive study design based on the Good Governance Theory, which highlights transparency, accountability, efficiency, and civic participation as main principles of good public administration (Grindle, 2007). The theory offers a conceptual framework for examining how digital interventions, in this case those brokered by international development actors such as the World Bank, reshape institutional practices and enhance the quality of governance. In this context, the study tests whether World Bank-funded technical and financial support for land administration has helped digitalize land management in Punjab, and how such a transition has impacted core governance outcomes like transparency, administrative efficiency, and public trust.

The research is a secondary data analysis dominated by official government reports, World Bank project reports, peer-reviewed journals, implementation status reports, and third-party reviews between 2010 and 2025. The key data sources are Punjab Land Records Authority (PLRA) reports, World Bank Implementation Status and Results (ISR) reports, and research studies of digital governance, biometric identification, and institutional change in Pakistan. Further material was searched on databases like JSTOR, Scopus, and Google Scholar utilizing keywords as "land digitalization in Punjab," "World Bank governance reform," and "e-governance in Pakistan."

Data were thenatically content analyzed, and those themes that recurred consistently across the literature, such as financial and technical assistance, institution building, legal reform, and problems of implementation, were codified. They were subsequently mapped onto the elements of the Good Governance Theory in order to determine how the CLRMIS project measures up against the criteria of sound governance.

To maintain robustness, the research triangulates evidence from various sources of evidence. For instance, quantitative measures such as decreases in service delivery time and decreases in the number of land conflicts are cross-checked with qualitative reports obtained from various stakeholders such as landowners, government employees, and legal practitioners. The research also critically analyzes claims made by implementation agencies to determine whether reported impacts are verified by independent third-party evaluation or independent confirmation.

Despite the fact that the study is exhaustive in coverage of recorded reforms, it is weakened by the fact that it draws only on second-order data, and the lack of primary fieldwork ensures that the capability to observe the lived experience of citizens firsthand is somewhat constrained. Despite this, the extremely broad spectrum of credible sources combined with the use of a governance-theory-based theoretical lens enables sound and analytically rigorous judgment of the World Bank's role in Punjab's digitalization reform of the land.

Discussion

Computerization of land records in Punjab is a historic transformation of a centuries-old manual exercise to a contemporary technology-driven land governance. It has been achieved with the huge help of the World Bank. The old Patwari system, which was marred by inefficiency, corruption, and lack of transparency, had grave problems for the owners of the lands, particularly in the rural areas (Rehman, 2013). These issues were tackled by the Punjab Government, with financial and technical support from the World Bank, by initiating the Computerization of Land Records Management and Information Systems (CLRMIS) project. The objective was to establish an open, accessible, and citizen-centric land record system. In this chapter, the World Bank's role is explained in planning, financing, executing, and enhancing the electronic land record system in Punjab.

Financial and Technical Support by the World Bank

The World Bank has been pivotal in financing the digitalization of Punjab land records. Noting the past inefficiency, inaccessibility, and corruption associated with the manual land administration system, the Government of Punjab collaborated with the World Bank in 2007 to develop the Computerization Land Records Management and Information Systems (CLRMIS) Project (Ahsan et al., 2025). This initiative was the first massive attempt to computerize the land record system using digital technologies. World Bank intervention was in the form of two major components: financial and technical support. Both were instrumental in assisting the province shift from an age-old, paper-based system of land records to a new, transparent, and citizen-centric electronic system.

World Bank Financial Contribution

The financial contribution of the World Bank was distributed in the form of money and other types of contributions. The financial contribution was made through an IDA credit facility. The CLRMIS project was estimated to cost around USD 70 million, out of which the World Bank provided USD 45.5 million. This financing contributed largely to physical infrastructural development, buying advanced technology, and the recruitment and training of staff in each district of Punjab.

The money was used to create more than 150 Arazi Record Centers (ARCs) across the country where people could access facilities including confirmation of land ownership, issuance of land extracts (fard), and property transfer (Ahsan et al., 2023). The offices were constructed using the same floor design as each other and had facilities including biometric machines, high-speed servers, computer terminals, and data entry systems. The resources also included large-scale digitization and input of over 10 million land ownership records, which were kept in handwritten registers by Patwaris.

Training was the next most crucial field where money was spent. Thousands of personnel, ranging from computer operators to service center in-charges and revenue department officers, were trained in the management of the digital system. The capacity-building activities ensured human resources were aligned with the technological improvement brought about by the project.

Technical Assistance and System Design

In addition to the funding, the World Bank also offered extensive technical assistance, which was instrumental in building the foundation of e-governance. The World Bank officials engaged in close collaboration with the Punjab Land Records Authority (PLRA) to ensure that CLRMIS was introduced in accordance with international best practices. They assisted in creating a centralized database framework that would be accessible in all ARCs in the province. It provided online access to land records and the mitigation of the risk of tampering with or duplication of information.

The World Bank also led the charge in creating easy and intuitive interfaces, which were open to the public as well as government officials. Biometric verification was one such innovation that was made possible with the facilitation of the Bank (Morake, Khoza, & Bokaba, 2021). The technology ensured that authenticated landowners transacted only, thus minimizing identity theft and misappropriation of property.

Legal and Security Reforms

Apart from system development, the World Bank was involved in legal and regulatory reforms required to enable digital records. No pre-project law had acknowledged electronic land records as valid documents. Under technical guidance by the World Bank, the Punjab government revised the concerned laws, such as the Land Revenue Act, to enable legal backing for electronic land transactions and records (Rafiq, Bilal, & Mustafa, 2021).

In addition, cybersecurity and data protection were also taken into account as parts of the system. The World Bank advised secure servers to be used,

communications to be encrypted, and firewalls to be in place to block any unauthorized access. These would guarantee that the electronic system would always be reliable, confidential, and non-tamperable.

Establishment and Expansion of Arazi Record Centers (ARCs)

One of the most critical aspects of Punjab's land digitalization reform, financed by the World Bank, was the establishment of Arazi Record Centers (ARCs). They were the human interface through which citizens interacted with the digitized land record system. Until then, citizens had to depend on the antiquated Patwari system, a system much maligned for being outdated, inefficient, and corrupt. Manual management of land records created a multitude of issues, including forgery, transaction delay, and absence of easy access to legal documents (Soner, Litoriya, & Pandey, 2021). There were problems faced by many landowners, particularly rural landowners, in acquiring records of ownership and transferring property because of the Patwaris' monopoly and lack of an easy system. Introduction of ARCs saw a move away from such conventional backlogs and towards a newer, people-centric model of land management.

The setup of ARCs was enabled by financial and technical assistance being offered by the World Bank under the Land Records Management and Information Systems (LRMIS) project. The project focused on enhancing efficiency, transparency, and access to land records in Punjab. The construction and operational installation of over 150 ARCs in all 36 districts of Punjab were funded by the World Bank. Every center was designed to standardized specifications so that the same level of service quality could be provided across the province. Improved technology, including biometric verification systems, high-speed internet connectivity, CCTV cameras, digital scanners, and a centralized database for access to information regarding ownership of land, was provided to the ARCs (World Bank, 2014).

The principal aim of ARCs was to deliver land services to the public without a mediator. The services are provided at the ARCs, like the dispatch of a fard (duplicate of the record of ownership of land), mutation of land (change of ownership), verification of ownership, and settlement of gift and inheritance transactions. Services earlier under the administrative power of one Patwar in a discretionary and secret manner were brought into regulation and norms (Wani, 2023). This reform drastically minimized the possibilities of corruption, document forgery, and illicit transfer of land. The technical staff of the World Bank made certain that the ARCs ran smoothly in tandem with the Punjab Land Records Authority (PLRA). The most important reform introduced was that of biometric verification systems. In the new system, the sale of land only took place after the owner of the land had been established through the use of biometric information, e.g., thumbprints. This ensured that it was impossible for anyone unauthorized to transfer or acquire land without registration. This was much better than the earlier one, where documents written by hand could be forged or altered.

As for efficiency, the deployment of ARCs reduced the cost and time taken in land-related services significantly. As per the World Bank's 2016 impact assessment, the average time to release a land ownership certificate was shortened from weeks to under 30 minutes (Crawfurd, Hares, & Todd, 2024). Likewise, the time to complete land transfers and mutations was reduced from months to days. Individuals no longer needed to travel back and forth or pay bribes to receive documents that were theirs. This heightened efficiency meant increased satisfaction on the part of landowners and increased trust in government land services by the public.

The World Bank also funded capacity-building schemes to manage ARCs professionally and efficiently. Specific training modules for service center officials, technical experts, and administrative staff were designed. All sorts of topics, like digital data entry to system administration, biometric identification, customer care, and ethical behaviour, were covered in these training modules. With training, staff could manage the new systems with ease and deliver services to citizens professionally and respectfully.

One of the other notable advantages of the ARCs was that they provided positive impacts on rural accessibility. Most rural areas in Punjab had been previously inaccessible to formal land administration services because of distances, infrastructure deficiencies, and control by local power points (Ahmad, 2022). Access to land services since the provision of ARCs in all tehsils and subdivisions has been extended to remote and underserved areas. People in such regions could now get official documents and conduct land transactions without needing to go a long distance or relying on well-connected middlemen. Some ARCs even initiated gender-responsive services, like women-only counters and mobile service vans, in a bid to provide inclusive delivery of services for every section of society.

In spite of the success stories, there were some implementation issues noted. There were also

interruptions to power supply and internet connectivity in some districts, disrupting the service delivery. Secondly, the majority of rural citizens were not very digitally literate, thus the skepticism about the new system. These challenges were addressed by the World Bank, suggesting that PLRA should use funds for public awareness and digital literacy initiatives. Some of these initiatives included handing out brochures, public forums, and airing messages on the local radio and television stations to educate people on how to utilize ARC services and the advantages of the new system.

Impact on Transparency, Effectiveness, and Public Confidence

The Punjab government's computerization of land records, funded by the World Bank under the Computerization Land Records Management and Information Systems (CLRMIS) project, has made a significant and quantifiable contribution to land administration. The most significant effect has been enhanced transparency, efficiency, and public confidence in the system. The reform transformed land administration from being paper-based, secretive, and at times corrupt to being digital, rule-based, and transparent. Not only was it easier to provide services, but it also revolutionized the attitude of how people viewed the land administration process, making it a level and equitable platform for every landowner.

Fostering Transparency in Land Administration

During the old Patwari-based system, land transaction transparency was deplorably absent. The records were registered manually on paper registers and under the safe custody of individual Patwaris with minimal supervision (Mansoor, Ali, Mateen, Kaleem, & Nazir, 2023). This resulted in frequent modifications in the records, loss or destruction of vital documents, and unauthorized land transfers. Most of the citizens did not have direct access to their own land information, and even to obtain a straightforward ownership certificate, personal connections, extra-legal payments, or frequent visits to administration offices were necessary. Such a context bred mass distrust of the land administration system.

Computerization of land records, facilitated through World Bank finance and technical support, addressed these challenges directly. The process of electronic record-keeping provided an easily accessible, centralized database of land ownership and transaction history. The records were reinforced with biometric authentication and timestamped records, thus enabling the detection of any modification of the land data. This only minimized the room for spurious tampering or forgery (World Bank, 2016).

Arazi Record Centers (ARCs), one in each district, were the government offices of land records. The citizens could seek an electronic record of their certificate of land ownership (fard), bring about a transfer, or authenticate a land transaction with clear steps and affordable fees. The identity verification and biometric systems provided an added layer of protection, with only legal owners or authorized individuals allowed to make changes. The use of CCTV surveillance and audit trails also facilitated transparency through recording workers' activities and preventing excessive opportunities for corruption.

Enhancing Efficiency and Minimizing Delays

The CLRMIS program also brought in considerable enhancements in working efficiency. Land services under the existing system were sluggish and capricious. For instance, it would take weeks or months to obtain a fard or conduct a property transfer. Lack of standard procedures and the requirement for approval from more than one official caused undue delays and increased costs to citizens.

The electronic land records system introduced enormous reforms. In line with the World Bank's 2016 impact assessment, the duration to acquire a document of ownership of land decreased by more than 80% (Ali & Deininger, 2022). The majority of citizens were able to acquire their fare within 30 minutes from an ARC. Likewise, mutation (transfer of ownership) was cut down from weeks to a few working days. These service time cuts not only increased user satisfaction but also released administrative capacity in the government so that more citizens could be dealt with by employees more accurately.

An increase in land-related transaction costs also went towards coming down. Without bribes paid and middlemen recruitment, the citizens saved money. Further, fixed service fees were prominently made public at ARCs to prevent charging extra money and making payment procedures more predictable. This shift especially favoured small-scale farmers and landowners who previously could not access legal services for their lands. Gains in efficiency benefited businesspeople and investors, who could validate land titles more conveniently and invest in agricultural or urban development schemes.

Restoring Public Confidence in Land Administration

Perhaps the most revolutionary effect of the reform was in restoring public confidence in land administration. In the earlier regime, the image of land administration in public view was extremely poor (Roestamy, Martin, Rusli, & Fulazzaky, 2022). Patwaris were regarded as custodians of land data and acted in an interest-based mode. Loss of papers, illegal entries into registers, and prejudiced judgments were regular acts. Hence, individuals did not bother to interact with the system, and rather interacted through informal means, which were unreliable and not lawfully binding.

The CLRMIS project turned this attitude on its head by offering systematic, rule-based, and citizen-centric services. ARCs were manned by trained staff employing standardized processes, and the citizens were treated equally irrespective of their economic or social status. The professionalism and accessibility of ARC staff instilled confidence in the new system (Sasada, Kawai, Masuda, Taenaka, & Kadobayashi, 2023). Redressal mechanisms, complaint forms, and helplines also enabled citizens to file grievances, rectify errors, and avail redressal practically non-feasible in the older system.

From internal records taken by the Punjab Land Records Authority (2022), over 80% of customers using ARCs found that they were satisfied with the service they received. This was overall, including satisfaction with how long the processing took to answer their application, employee attitude, and impartiality of the process. Public confidence was also boosted when citizens saw that influential people could no longer tamper with records to their own advantage. The reforms implemented a culture of justice and equality within the land administration system.

One specific indirect effect of this greater public trust was the legalization of land ownership. Various citizens who had previously avoided official registration of their property due to fear or suspicion of corruption started registering their property under the new regime (Unruh, 2023). It assisted in enhancing tenure security, lowering land conflicts, and enhancing access to credit and public services. Formal land titles in the rural zones, in particular, allowed farmers to invest in agricultural lands, mortgage them, and participate more actively in the economy.

Institutional Development and Capacity Building

One of the CLRMIS project's success ingredients was the strong focus put on institution-building and capacity-building. The World Bank, in addition to providing financial and technical support, also played a significant role in helping the Government of Punjab in laying down a consistent and professional institutional framework capable of addressing the new computerized land governance regime. This part describes how the World Bank assisted in developing human resources, institutional change, legal reorganization, and administrative reform, all of which were central to ensuring that efforts towards digitalizing the land would be sustainable.

Institutional Reform through PLRA Formation

Prior to the digitalization project, the records of land were handled by the conventional revenue department under the authority of Tehsildars and Patwaris (Shahrukh & Mustafa, 2025). The institution was impenetrable, ill-controlled, and paper-documentation dependent. For enabling and sustaining the new digitalized system, a professional, contemporary organization with a precise legal and organizational framework had to be established. With the help of the World Bank, the Punjab Government set up the Punjab Land Records Authority (PLRA) in 2017 as an independent agency to manage all land record operations. The World Bank provided policy directions and technical assistance to assist in defining the organizational structure, operations, and governance model of PLRA. This entailed helping it draw up the legal document on how it would operate and internal procedures, and systems.

PLRA was charged with the responsibility of keeping computerized land records, running Arazi Record Centers (ARCs), and providing delivery of services using professional human resources. Freedom from conventional bureaucratic hierarchies made it possible for PLRA to embrace modern technology, hire competent staff, and initiate performance-based accountability systems. The organization of PLRA noted a transition from discretionary and manual land administration to a technology-enabled and professionalized system.

Training and Human Resource Development

Capacity development was another area in which the World Bank made a difference. Land record digitalization and providing services through ARCs necessitated a human resource pool with the new technical expertise (Rahman, Hartanto, Khuzaini, & Shaddiq, 2023). Most of the personnel of the revenue department, even the experienced ones who had years of service in the manual system, did not have the know-how to use digital databases, maintain biometric verification equipment, and provide new service processes. In order to respond to this, the World Bank assisted in formulating and implementing

large-scale training for employees at all levels. Thousands of people, ranging from computer operators to ARC managers, data entry personnel, and administrative officers, were formally trained. The courses addressed topics ranging from digital data management and software use to customer service, ethical behaviour, and redress of grievances.

Step-by-step training and coordination with the implementation of ARCs at the district level were carried out. In addition, the World Bank suggested online modules, peer education, and refreshers to keep staff members continuously up-to-date on new features in the system. Such a learning culture ensured smooth delivery without any inconsistencies and reduced errors, particularly during the initial phases of implementation. In PLRA reports, they had over 3,000 employees trained between 2017 and 2022. The desired outcomes of the training materialized in faster speed, accuracy, and courtesy in the delivery of service in the province.

Developing Service Standards and Monitoring Systems

The World Bank also supported the establishment of performance standards and monitoring tools to enable the professional development of land administration. Clear guidelines for service delivery, maximum processing time, fixed service fees, and mechanisms for complaints were instituted. These were publicly displayed at every ARC to ensure transparency and information awareness among users.

The World Bank also assisted in creating an automated system to monitor service requests, staff attendance, transactional history, and the rate of complaint redressal (Castri, Grasser, & Kulenkampff, 2020). These metrics were utilized to monitor the performance of all ARCs and detect areas where training or assistance was required. Deployment of technology-based monitoring systems helped ensure institutional efficiency was upheld and enhanced in the long term.

Focus on institutional transparency, staff accountability, and service quality contributed to a results-oriented culture in PLRA and ARCs. Not only did the citizens receive their services more quickly, but they were dealt with respect and professionalism by government staff, an element that was lacking in the former paper-based system.

Legal and Regulatory Strengthening

Institutional transformation towards long-term sustainability requires to be followed by modifications to current land policies and laws. The World Bank gave technical assistance to the Punjab government in redefining the laws that in the past depended on paper recordkeeping and discretionary power (Bashir & Nisar, 2020). The Land Revenue Act and other connected legislation were amended to establish digital records as admissible evidence in courts, legalize biometric systems, and establish the legal roles of PLRA.

These law reforms provided the fertile soil for the institutional reforms to become effective. Without a sound legal framework, computer records would not have been given legal approval, and cases emanating from computer-based transactions would not have been given formal adjudication. The experience that the World Bank gained in administering land in other places made the legal environment of Pakistan align itself with international parameters and best practice.

Constraints and Challenges of the Digitalization Process

Digitalization of Punjab land records with the help of the World Bank was a monumental step in the right direction, but by no means an easy one. The challenges slowed down the pace and effectiveness of implementation and indicated areas to be overhauled.

Resistance by Traditional Stakeholders

The first resistance came from Patwaris, who had a traditional handle on land documents. The computerized system lessened their power and scope for income, so they were resistant. Patwaris turned in land documents late or gave incomplete records during the process of digitization in certain regions. The process was delayed because of this (Shahrukh & Mustafa, 2025).

Low Digital Literacy and Awareness

Most of the population, particularly rural residents, were unaware of digital services. Women, older persons, and less educated individuals were mostly hesitant to use computerized systems. Lack of awareness hindered access to equality at Arazi Record Centers (ARCs) and promoted reliance on intermediaries.

Infrastructure Limitations

There were also technical issues that impacted the functioning of ARCs. In rural areas, there was poor connectivity and no consistent power supply, which hindered the provision of uninterrupted services. The delays frustrated citizens and made the system less

efficient overall (Velaga, Beecroft, Nelson, Corsar, & Edwards, 2012).

Data Accuracy Issues

Earlier records of the land were mostly handwritten, incomplete, or outdated. Others were also ambiguous in their boundary definitions or had unsettled disputes. Consequently, their verification and updating to complete the digital database were cumbersome and time-consuming.

Cybersecurity Concerns

Centralized websites hold sensitive ownership data. The absence of robust cybersecurity ensures that there is a threat of alteration or leaks of the information (Kumar, 2023). Even though the World Bank advocated for secure systems, cybersecurity remains an issue that needs persistent focus.

Legal and Institutional Gaps

Although computer records were legally recognized, there were also some courts and departments that did not adopt them as valid evidence right away. This caused delays in legal proceedings concerning land and uncertainty for the users.

Conclusion

Computerization of land records in Punjab under World Bank assistance through the CLRMIS project is a pioneering exercise in public sector reform. By eliminating the outdated Patwari system and establishing a state-of-the-art, technology-based infrastructure, the program vastly increased transparency, put brakes on bureaucratic arbitrariness, and sped up service delivery. Development of Arazi Record Centers (ARCs), implementation of biometric authentication, and establishment of the Punjab Land Records Authority (PLRA) collectively were a move towards citizen-centric governance. Based on the principles of Good Governance Theory, the project illustrates how technical assistance and donor-financed international support can be an impetus for structural change in developing environments.

While intervention was dramatic in public trust and service delivery, it was also faced with issues of an endemic nature, such as illiteracy in the information age, infrastructure shortages, and institutional resistance. The setbacks point to the need for long-term policy commitment, outreach inclusivity, and responsive legal and policy frameworks to assure sustained success. Generally speaking, the Punjab experience is a template for emulation in other parts of the world wishing to computerize land administration and increase equitable access to property rights through electronic governance.

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