

Assessing Urban Land Administration Capacity to Achieve 2030 Agenda for Sustainable Development in Pakistan

Muhammad Sheraz AHSAN, Pakistan, Salman ATIF, Pakistan, Christiaan LEMMEN, the Netherlands, Ejaz HUSSAIN, Pakistan, Mila KOEVA, the Netherlands, Jaap ZEVENBERGEN, the Netherlands, Zahir ALI, Pakistan, Abdul WAHEED, Pakistan

Key words: Sustainable Development Goals, Sustainable Cities, Board of Revenue, Punjab Land Record Authority, Capital Development Authority, Real Estate, Cadastre

SUMMARY

The Urban Land Administration System (LAS) includes land tenure, value, use, and development and has significant social, fiscal, legal, and technical implications. An outdated LAS can create challenges and obstacles to achieving sustainable societal development. In 2015, the United Nations established the Sustainable Development Goals (SDGs) to ensure peace and prosperity for all by protecting the planet and ending poverty. This research aims to assess the capacity of urban LASs to achieve the SDGs related to land and property. The research methodology includes identifying the SDG targets and goals related to urban LAS, conducting an appraisal of existing urban LAS organizations in the study area and their challenges, and assessing SDGs in the context of urban LAS policies and legislative frameworks using a literature review and owner-buyer interviews based on a questionnaire. Pakistan's population rapidly grew from 132.35 million in 1998 to 241.5 million in 2023. The annual growth rate in urban areas is notably higher at 3.65 percent compared to rural areas' 1.9 percent, putting a considerable burden on existing manual LASs. There is a hybrid legislative framework for urban areas, including the British colonial system and the contemporary system. The results show that Pakistan falls behind in achieving most of the SDGs targets related to LAS. We interviewed 119 owner-buyers belonging to different LASs, and most of them faced difficulties while interacting with the LASs. Most believe computerization, GIS technology, and national/international standards can resolve issues and improve LAS efficiency. Pakistan has started LASs computerization, and achieving SDGs in the near future may be possible.

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SUMMARY (خلاصہ)

شہری زمین و حبا ئید ادا کا انتظام و انصرام اس میں موجود حبا ئید اداوں کی ملکیت کی معلومات، مالیات کی وصولی، زمین کا مختلف اعراض و مقاصد کے لیے استعمال اور اس میں موجود بنیادی شہری ڈھانچے کی ترقی پر مشتمل ہوتا ہے۔ اور ان سب امور کا سماج، معیشت، قوانین اور صنعت و حرفت پر گہرے اثرات ہیں۔ اگر شہری زمین و حبا ئید ادا کا انتظام و انصرام موثر طریقے سے فعال نہ ہو اور منسودہ ہو چکا ہو تو یہ پائیدار سماجی ترقی کی راہ میں ایک بہت بڑی رکاوٹ اور آزمائش ہے۔ سنہ ۲۰۱۵ میں اقوام متحدہ نے پائیدار ترقی کے اہداف مقرر کیے تاکہ کو عنبرت کے حنا تمے اور اس سیارے کو محفوظ بنانے سے تمام دنیا والوں کو امن و خوشحالی نصیب ہو۔ اس تحقیق کا مقصد یہ ہے کہ ہم شہری زمین و حبا ئید ادا کا انتظام و انصرام کرنے والے نظام کی استعداد کار کو جانچ سکیں کہ آیا وہ زمین و حبا ئید ادا سے متعلق پائیدار ترقی کے اہداف کے حصول کی کتنی صلاحیت رکھتے ہیں۔ اس تحقیقی مقالہ میں ہم نے سب سے پہلے زمین و حبا ئید ادا سے متعلق پائیدار ترقی کے مقاصد و اہداف کی نشاندہی کی ہے اور زمین و حبا ئید ادا کا انتظام کرنے والی تنظیموں کی استعداد کار اور ان کو درپیش مسائل کا جائزہ لیا ہے۔ اس تحقیقی مقالہ میں ہم نے زمین و حبا ئید ادا کے مالکان اور خریداروں کی رائے کو بھی شامل کیا ہے۔ سنہ ۱۹۹۸ میں پاکستان کی کل آبادی تقریباً تیس لاکھ تھی جو سنہ ۲۰۲۳ میں تیزی سے بڑھ کر چوبیس کروڑ پندرہ لاکھ تک پہنچ گئی۔ دیہاتی علاقوں کی آبادی میں بڑھوتری ایک اشاریہ نو فیصد جبکہ شہری علاقوں میں یہ بڑھوتری کافی زیادہ ہے، جسکی شرح تین اشاریہ چھ فیصد ہے۔ اسی وجہ سے شہری علاقوں کے انتظامی معاملات، خاص طور پر زمین و حبا ئید ادا کے دستی انتظام پر اچھا خاصہ دباؤ ہے۔ نتائج سے معلوم ہوتا ہے کہ پاکستان اقوام متحدہ کے وضع کردہ اہداف کے حصول، خاص طور پر زمین و حبا ئید ادا سے متعلقہ اہداف کے حصول، میں کافی پیچھے ہے۔ زمین و حبا ئید ادا کے ۱۱۹ مالکان اور خریداروں میں سے زیادہ تر کی رائے کے مطابق ان کو زمین و حبا ئید ادا سے متعلق کاموں میں کافی مسائل کا سامنا درپیش رہا ہے، تاہم انکی رائے کے مطابق موجودہ نظام میں کمپیوٹرائزیشن، جنسرافیائی معلومات کے نظام کا استعمال، قومی اور بین الاقوامی معیارات کو لاگو کرنے سے ان مسائل سے کافی حد تک چھٹکارہ ممکن ہے۔ پاکستان میں زمین و حبا ئید ادا کے انتظام کے لیے کمپیوٹرائزیشن کا آغاز ہو چکا ہے، اور مستقبل قریب میں امکان ہے کہ پائیدار ترقی کے ان اہداف تک پہنچنا ممکن ہو سکے۔

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1. INTRODUCTION

Land Administration Systems (LASs) in Pakistan are technically categorized into the Board of Revenue (BoR) and the Contemporary systems in urban areas. The BoR was introduced and established during the British Colonial era a hundred years ago (Ali & Nasir, 2010; Baden-Powell, 1892; Nayak, 2020; Robinson, 1856; Sengupta et al., 2016). As cities expanded, urban LAS started taking shape in the country. Multiple LAS stakeholders have evolved under the Contemporary system in urban areas. Organizations such as Development Authorities (DA), Housing Authorities (HA), Private Housing Societies (PHS), Cooperative Housing Societies (CHS), Municipal Corporations (MC), Excise and Taxation Departments (ET&D), Cantonment Boards (CB), Federal Board of Revenue (FBR), and provincial Boards of Revenues are involved in the Contemporary system (Ahsan et al., 2023). As a national surveying and mapping agency, the Survey of Pakistan is neither mandated to perform LAS functions nor demarcate land boundaries. Instead, the LAS organizations have internal arrangements to conduct physical field surveys to demarcate boundaries without any datum, projection, or coordinate system. Pakistan's LASs are manual, fragmented, and disintegrated. Pakistan's population has experienced rapid growth, increasing from 132.35 million in 1998 to 241.5 million in 2023. Notably, the annual growth rate in urban areas is 3.65 percent, significantly higher than the 1.9 percent growth rate in rural areas. This substantial population growth has placed a significant burden on existing manual LASs. Figure 1 provides a concise overview of the significant historical milestones in Pakistan's LAS.

(1858-1947)	(1948-1960)	(1961-1999)	(2000-2023)
British Rule -Major land reforms -Key Legislation for LAS -Deed registration system -Fiscal nature of LAS -Agriculture at heart of LAS	Post Independence -Adopted British legislation -Ceiling on land holding -Manual land record -Hand drawn revenue maps -Urban legislation for Islamabad	Setting the Scene -Reform for land holding size -LAS remain manual -Green revolution -Development authorities -Agriculture to industrial	21st Century -Rapid Urbanization -Computerization initiatives -Vision for Smart Cities -Urge for real estate development -Manual urban LAS

Figure 1: The historical evolution of LAS in Pakistan

A LAS consists of four core functions: Land Tenure, Land Value, Land Use, and Land Development (Enemark et al., 2005). Table 1 provides an overview of the LAS organizations and their function in Islamabad and Rawalpindi. Land tenure is the documented relationship between people and land, established by society and governed by rules to secure property and

land rights (FAO, 2002; Payne, 2001). The relationship (formal or informal and legal or customary) is a fundamental cornerstone for developing and implementing responsible and efficient LASs. In principle, land tenure clearly and conclusively describes the Rights, Restrictions, and Responsibilities (RRR) related to immovable properties. Land valuation is concerned with taxation, whereas land use and development are associated with the rational allocation of land for city sustainable growth as per master plan and effective enforcement of building bylaws. A well-functioning LAS can be built on an integrated geospatial information infrastructure to achieve sustainable social, environmental, and economic development, as shown in Figure 2.

Table 1: Types and functions of organizations for LA process in Islamabad and Rawalpindi

Who		Function			
LAS Organization Type	LAS Organization Name	Land Tenure	Land Use	Land Value	Land Development
Public (Government)	Development Authority (DA)	✓	✓	✓	✓
	Provincial Board of Revenue (BoR)	✓	✗	✓	✗
	Federal Board of Revenue (FBR)	✗	✗	✓	✗
	Excise and Taxation Department (ET&D)	✗	✗	✓	✗
	Cantonment Board (CB)	✗	✓	✗	✓
Semi-Government	Housing Authority (HA)	✓	✓	✗	✓
Private	Cooperative House Scheme (CHS)	✓	✓	✗	✓
	Private Housing Scheme (PHS)	✓	✓	✗	✓



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Figure 2: The components of LAS to achieve sustainable development (Enemark, 2006)

The purpose of the research is to assess the capacity of LAS organizations in Pakistan to contribute to the achievement of the United Nations Sustainable Development Goals (SDGs). This evaluation will involve conducting a review of the LAS organization's capacity and interviews with property owner-buyers. Section 2 will examine the background of LAS and provide an overview of the study area, while Section 3 will explore the capacity, administration, and hierarchy of LAS organizations. Section 4 will contain research results with information about LAS-related SDGs and the findings from interviews with property owner-buyers to determine the capacity of LAS. Lastly, the research's conclusions will be presented in Section 5.

2. STUDY AREA

The study area consists of Islamabad and Rawalpindi cities in Pakistan (see Figure 3), with a total area of 906.5 square km and 415 square km, respectively. Islamabad (including suburbs or rural areas) is Pakistan's federal capital territory and the 6th most populous city (2.364 million). Rawalpindi (comprising municipal and cantonment limits) is a garrison city located in Punjab province, and it is the 4th most populated (3.358 million) in Pakistan. The twin cities are home to the third-largest urban population in Pakistan (PBS, 2024b). According to 2023 Sentinel-2 satellite land cover data (Karra et al., 2021), the total built-up area of Islamabad was 683 square km (51 percent), while Rawalpindi's was 226.5 square km (55 percent).

A private housing society acquires land from private land owners and prepares a land use plan by allocating land for residential, commercial, parks, roads, schools, graveyards, areas, etc. The land use plan is submitted to the relevant development authority for approval and proof showing that all the land has been acquired by the housing society. A no-objection certificate is issued by the development authority to the housing if the land use plan complies with their bylaws. A housing society is illegal if it fails to obtain the required no-objection certificate from the development authority and starts selling its properties. The total number of housing societies in the jurisdiction of five major DAs of Punjab are around 3,386, and more than half of those are illegal, see Figure 4. The approved societies only account for 29 percent of the total, while the under-process societies comprise 16 percent. Due to a lack of development control, violations of land use, and master plan regulations, around 70 percent of PHSs and CHSs are declared illegal in Islamabad and 77 percent illegal in Rawalpindi by development authorities (CDA, 2023; Govt. of Punjab, 2024). Due to the loopholes in the LASs, prolonged litigations and land grabbing are common; see Figure 5 and Table 02.

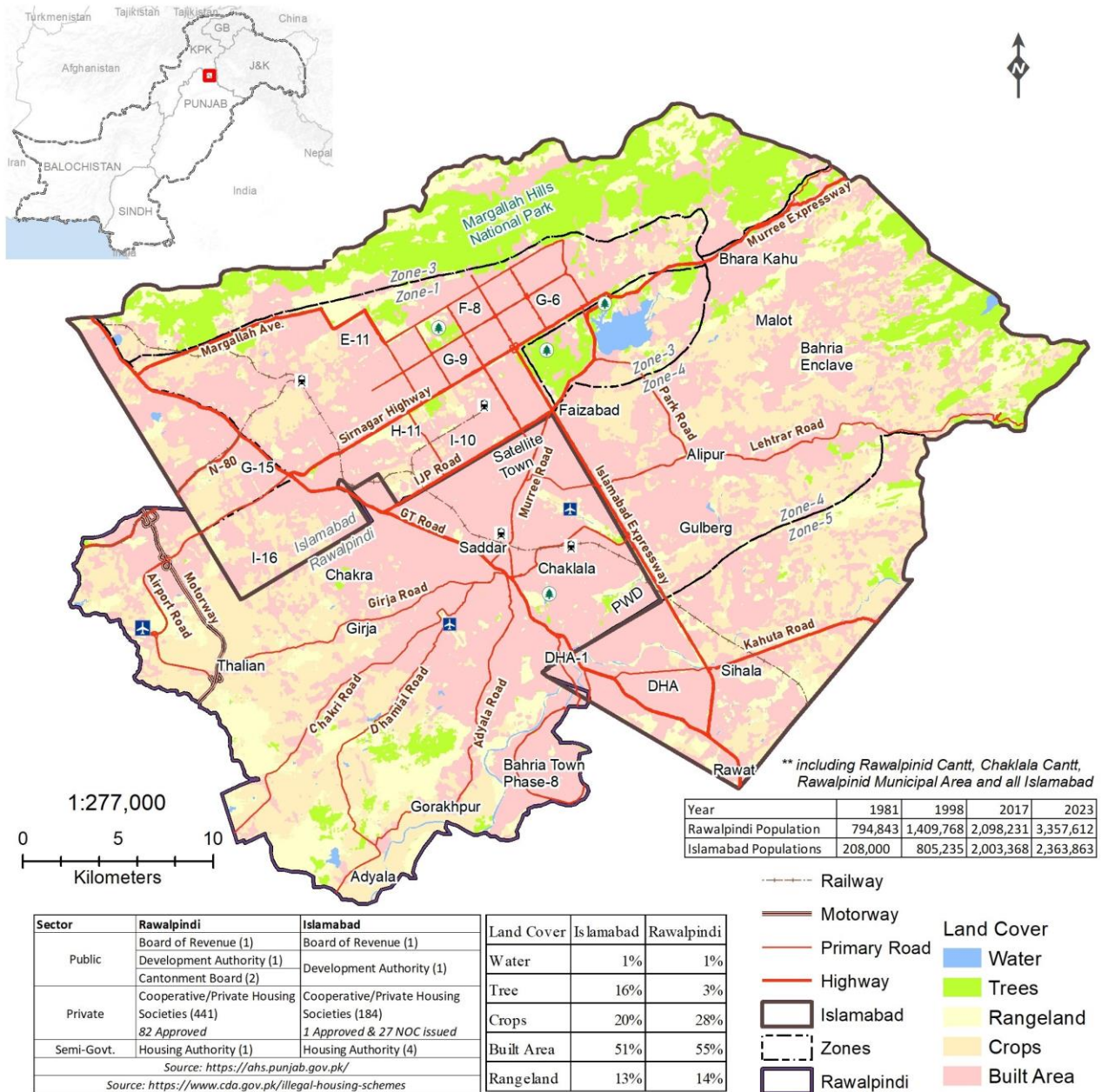


Figure 3: The study area map of Islamabad and Rawalpindi shows ESRI-based Sentinel Land Cover data for 2023. The data is available freely on ESRI Living Atlas as a Web Mapping Service.

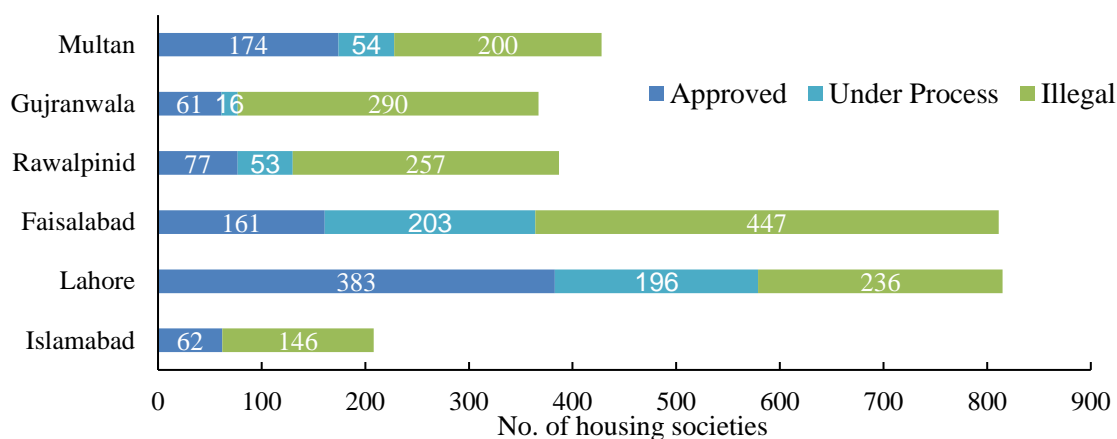


Figure 4: The status of housing societies in major cities of Punjab and Islamabad (CDA, 2023; Govt. of Punjab, 2024)

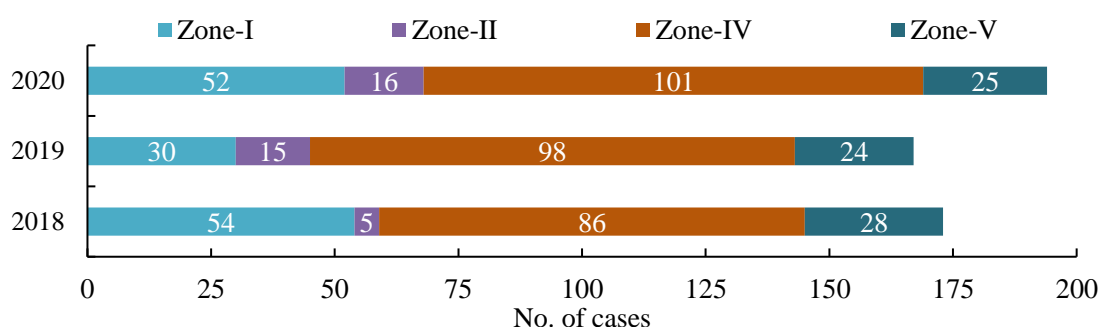


Figure 5: Zone-wise land grabbing cases in Islamabad during 2018-20 (Source: Islamabad Police)

Table 02: Status of land dispute cases at revenue courts in Islamabad during 2021

Revenue Court Type	Property Litigation Status (2021)	
	Decided	Pending
Chief Commissioner	08	20
Commissioner	30	62
Collector	96	65
Total	134	147

3. URBAN LAS ORGANIZATIONS

3.1 Public LAS Organizations

3.1.1 Capital Development Authority

The CDA was established in 1960 with a mandate to perform planning, development, regulation, and management of municipal services, tax collection, health, education, recreation, environment, and real estate in Islamabad. Most of the CDA operations related to the land tenure are administered by the Estate Wing and executed through a One Window Operation. The

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Islamabad Capital Territory Local Government Act (2015) and (2021) authorized the Metropolitan Corporation of Islamabad (MCI) to take charge of different activities related to services, development, utilities, environment, revenues, and tax collection in Islamabad. There is a long-standing controversy and overlap of jurisdictions between the MCI and the CDA, which are being resolved through court cases (DAWN, 2021; Kiyani, 2020). The MCI has still not functioned due to the suspension of local government for many years. The organizational and administrative hierarchy of CDA and MCI is given in Figure 6, Figure 7, and Figure 8, Figure 9, respectively. The red-highlighted administrative departments in Figure 7 are the ones to be transferred from CDA to MCI.

Along with its responsibilities as an urban regulatory body, the CDA is also mandated to develop housing schemes in Islamabad. The CDA manages the record of 184,971 housing units with a total area of 222 square km. in Zone-I of Islamabad (CDA, 2005; PBS, 2024a). The CDA was operating below capacity, as 35 percent of its top management positions were vacant in seven wings (CDA, 2020a).

The CDA Estate Wing is concerned with land tenure and to perform various LAS functions as given in Table 3. The One Window Operation was shifted to the Technology Wing in 2023.

Table 3: CDA estate Wing Functions and Human Resources (CDA, 2020a)

Sr	Directorate	Function	Employees
1	Estate Management-I	Residential plot management	103
2	Estate Management-II	Non-residential plots management	75
3	Enforcement	Remove illegal construction	472
4	Land and Rehabilitation	Land acquisition to develop new housing schemes	203
5	Law	Court cases and legal advice	10
6	One Window Operation	Services delivery for allotment, transfer of property	35
Total No. of Employees			905

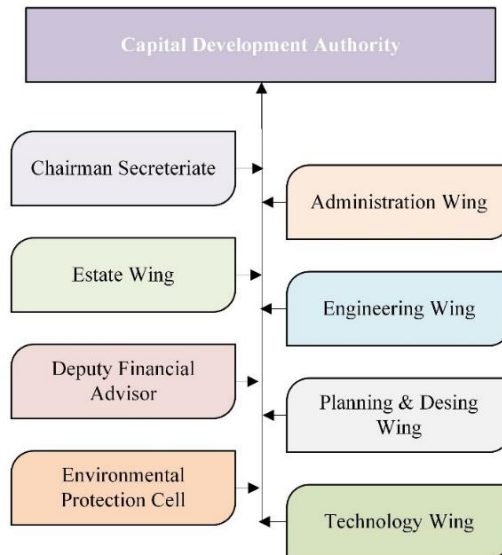
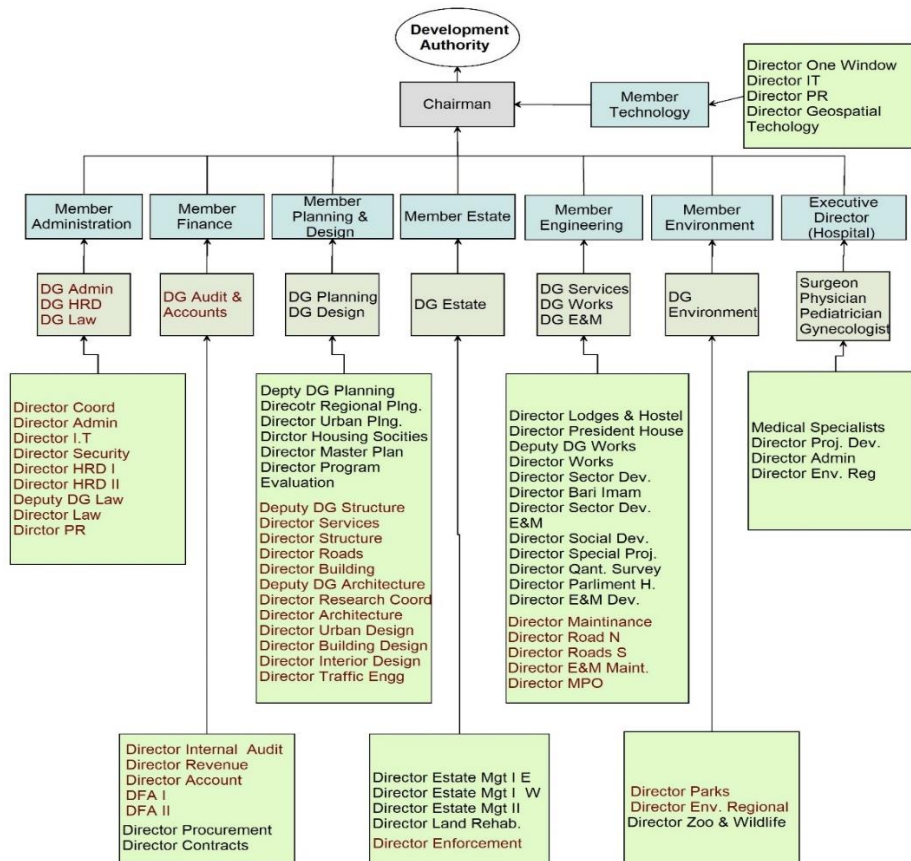


Figure 6: CDA organization hierarchy showing various directorates that perform urban administration and management functions



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Figure 7: CDA administration hierarchy showing executive posts and key human resources who perform administration and management function (CDA, 2020a)

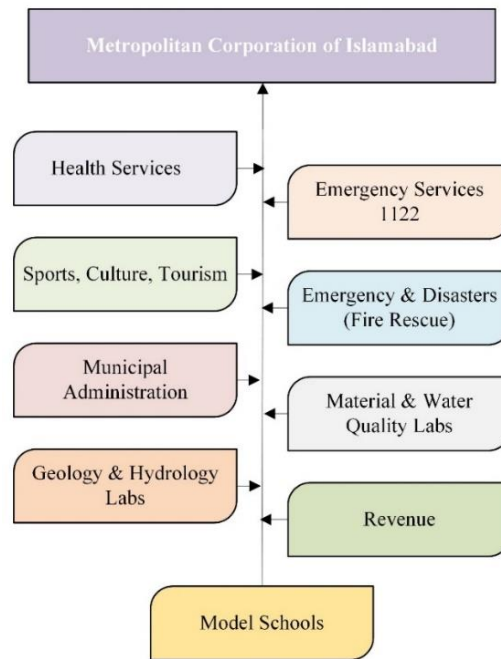
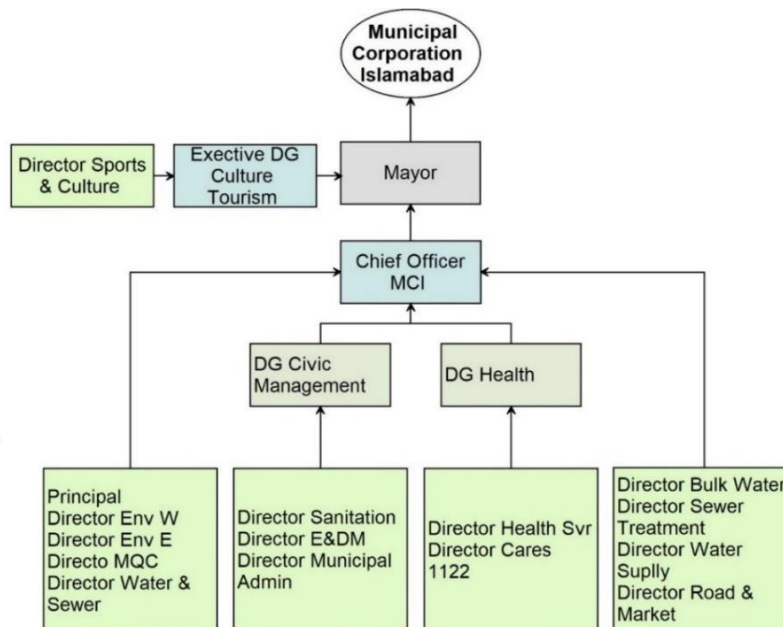


Figure 8: MCI organization hierarchy showing various directorates that perform urban administration and management functions in Islamabad (CDA, 2020a)



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Figure 9: MCI administration hierarchy showing executive posts and key human resources who perform administration and management functions in Islamabad (CDA, 2020a)

About 70 percent of the human resources at the Estate Wing of CDA have tertiary-level educational qualifications (equivalent to O-Levels/10 years or less, mostly non-technical); detail is given in Figure 10. More than 50% of the Wing employees belong to the enforcement directorate who have duties to remove illegal constructions in Islamabad.

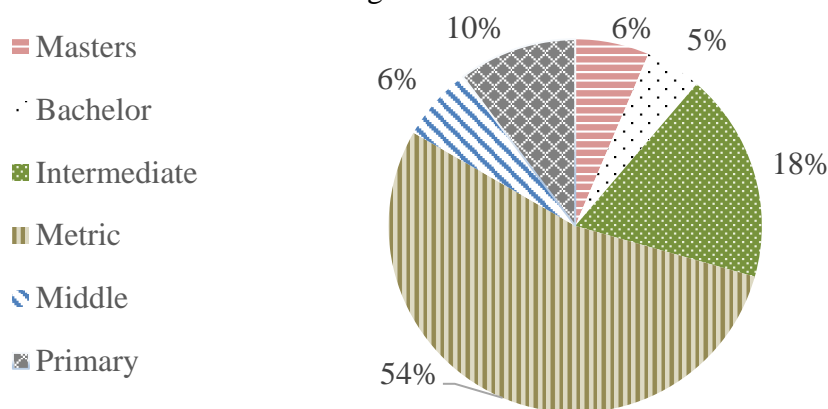


Figure 10: Educational qualification of CDA estate wing human resources who perform urban LA functions (CDA, 2020a)

Until 2023, CDA had no sanctioned human resources with technical capacity for Geographic Information Science (GIS) and Remote Sensing (RS). In 2023, the CDA IT Directorate was revamped and upgraded into a Technology Wing, including Geospatial Technology, involving skilled GIS and RS human resources to enhance CDA functions. The Geospatial Technology initiative aimed to digitalize manual paper maps, drawings, and layout plans using satellite and drone images and develop a decision support system. However, the fate of the initiative is still hanging in the air as it was planned for two years (Abbasi, 2024)

3.1.2 Rawalpindi Development Authority

The RDA in Rawalpindi performs a minimal role in land tenure management. The RDA estate management department manages the ownership record of only a few housing schemes, whereas most of the city’s land tenure is managed by BoR. The core functions of RDA are urban planning, regulating private housing schemes, rational land use allocation, building bylaws, sanitation, and water supply, among others; see Figure 11.

3.1.1 Board of Revenue and Cantonment Board

The BoR in Islamabad and Punjab province urban areas, including Rawalpindi, has different roles and responsibilities. The BoR plays a crucial role in land tenure management in Rawalpindi through sale deed registration and its mutation in the Record of Rights register. The BoR in Islamabad has a limited role, where an allotment letter is issued to an owner as legal proof of property ownership and is the source for land tenure management. The BoR capacity in Islamabad is given in the Figure 12 (Ali, 2013; Ali & Nasir, 2010). BoR has an operational

setup to manage LAS in Islamabad with a similar hierarchy as given in Figure 12 and discussed in detail by (Ahsan, Hussain, Lemmen, Zevenbergen, et al., 2024).

The BoR is upgrading the outdated LAS introduced during the British Colonial era. The Punjab Land Record Authority (PLRA) was established in 2017 to computerize and manage rural land tenure under the BoR. The PLRA, with the support of the World Bank, established the Land Record Management Information System (LRMIS) to facilitate rights holders with online land record availability, mostly in rural areas. In 2022, the Punjab Urban Land Systems Enhancement (PULSE) project (with the World Bank technical and financial support) was initiated to provide digital cadastral maps (both rural and urban areas) for LRMIS, digitalization of urban land records, development of spatial data infrastructure, computerization of deed registration records, and implementing unified LAS (see Figure 13). A future merger of the PULSE as a Geospatial Technology Wing in the existing PLRA (see Figure 14), and further enhancement of LRMIS with digital cadastral maps is under development. Cantonment Boards in Rawalpindi manage their land valuation, land use, and land development functions. However, land tenure in CBs is managed by BoR. Give more detailed descriptions of the figures below.

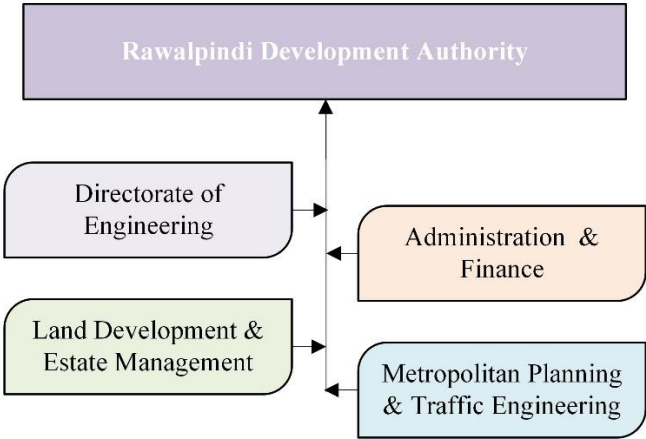


Figure 11: RDA organizational hierarchy showing various directorates that perform urban administration and management functions in Rawalpindi

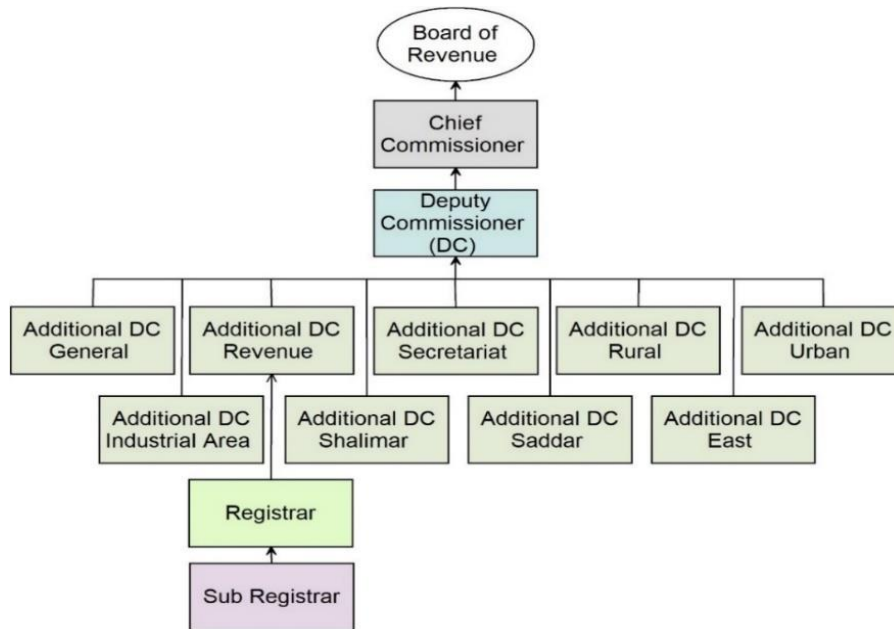


Figure 12: The BoR administrative hierarchy showing executive posts and key human resources who perform administration and management functions in Islamabad

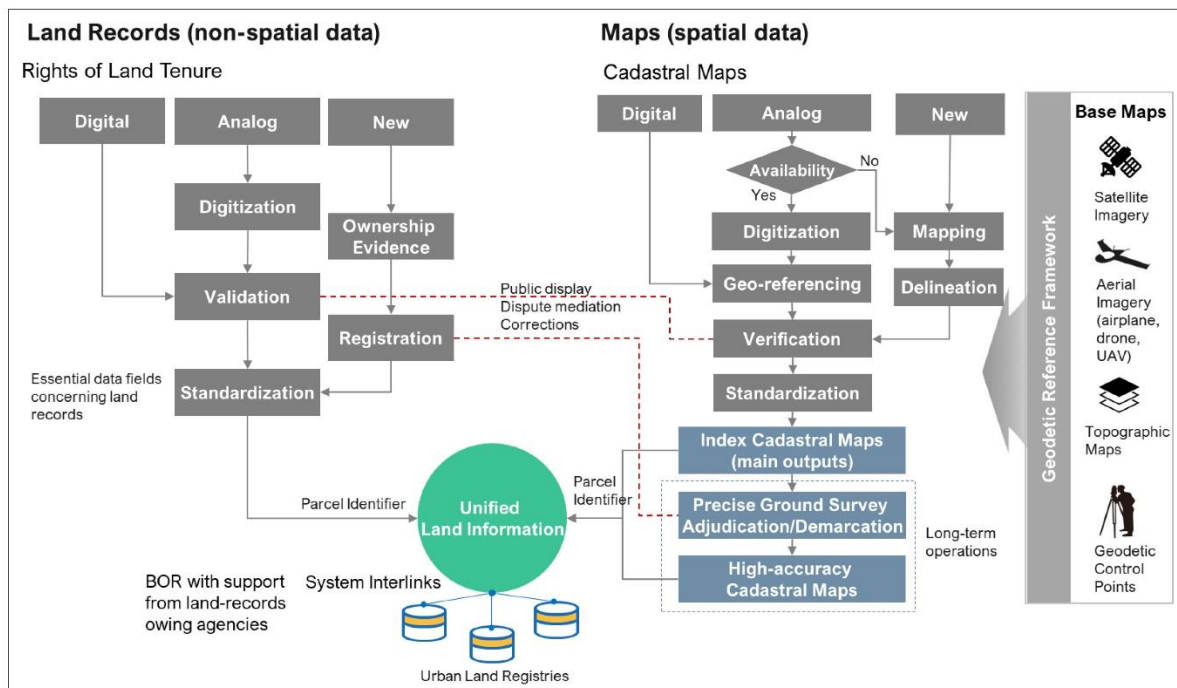


Figure 13: World Bank has proposed a unified land information by creating digital land records and cadastral maps using satellite/drone imagery and geodetic network under the PULSE Project (World Bank, 2022)

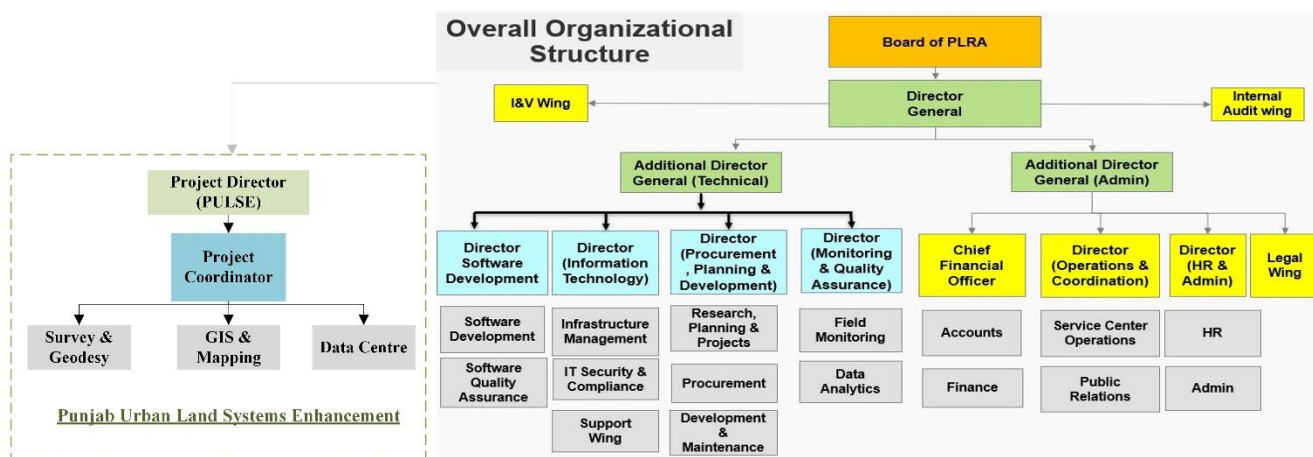


Figure 14: PLRA organizational hierarchy (PLRA, 2024) and PULSE as its future geospatial extension

3.2 Private and Semi-Government LAS Organizations

Under the bylaws of development authorities, the PHSs and CHSs develop housing schemes in urban areas. Private LAS organizations are not authorized to maintain land tenure registration through allotment files. A deed registration at a (sub) registrar's office is mandatory and is the only valid proof of property ownership in urban areas.

As the source of land tenure registration, the allotment file is authorized to semi-government organizations through legislation, such as the Defence Housing Authority (DHA) Act 2013 and the Federal Government Employees Housing Authority (FEGHA) Act 2020. However, both private and semi-government LAS organizations prepare their housing societies' layout plans according to the land use guidelines provided by the development authority through bylaws. Land valuation is done through BoR, ET&D, and FBR. Most private and semi-government LAS organizations have administrative and organizational hierarchies similar to CDA/RDA.

4. SDGs and URBAN LASs CAPACITY ASSESSMENT

In order to evaluate the capabilities of LASs in Islamabad and Rawalpindi, interviews were conducted with land and property owner-buyers associated with public, private, and semi-government LAS organizations. The authors visited these organizations in person and collected input using printed questionnaires. A total of 119 owners/buyers provided their responses. The data was entered into Microsoft Excel for analysis, with summaries and graphs prepared, as shown in Table 4 and following sub-sections.

Table 4: LASs capacity assessment questionnaire survey details

City	Owner-Buyer		
	Private	Public	Semi-Govt.

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	LAS Organization	LAS Organization	LAS Organization
Islamabad	21	24	17
Rawalpindi	26	31	0
Total	47	55	17

In 2015, the United Nations rolled out overarching development goals (SDGs) to ensure peace and prosperity for everyone, protect the planet, and end poverty. The SDGs envision global sustainability until 2030. The SDGs have 17 targets and 169 goals to tackle the challenges faced by humanity. Unger et al. (2021) and Ahsan, Hussain, Lemmen, Chipofya, et al. (2024) have identified the SDGs targets that are related to LAS. The following sub-sections discuss LASs capacity in Pakistan to achieve the SDGs targets.

4.1. SDG Target 1.4

SDG Target 1.4 says, “By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance”.

More owner-buyers found it difficult to interact with the existing LASs to transfer and verify their ownership information (see Figure 15 and Figure 16), more respondents were unsatisfied with the process (Figure 17) and they faced long queues and delays in registration and transfer of property (Figure 18). Government of Pakistan (2022) has provided an overview of the status of SDGs in the country. The report does not include an update of relevant details on Target 1.4. The capacity of LAS organizations in Pakistan is still evolving to achieve Target 1.4.

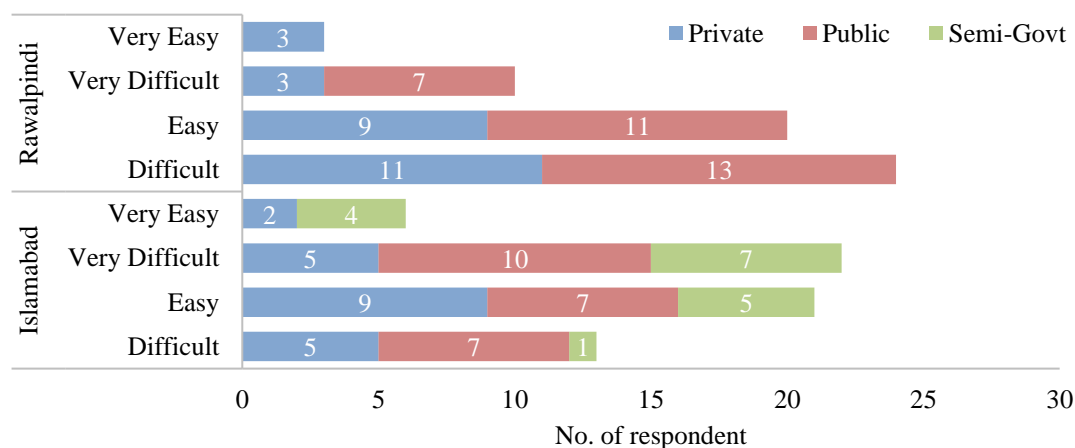


Figure 15: Is it easy for a prospective buyer to verify the seller's record of urban property? (attribute and map)

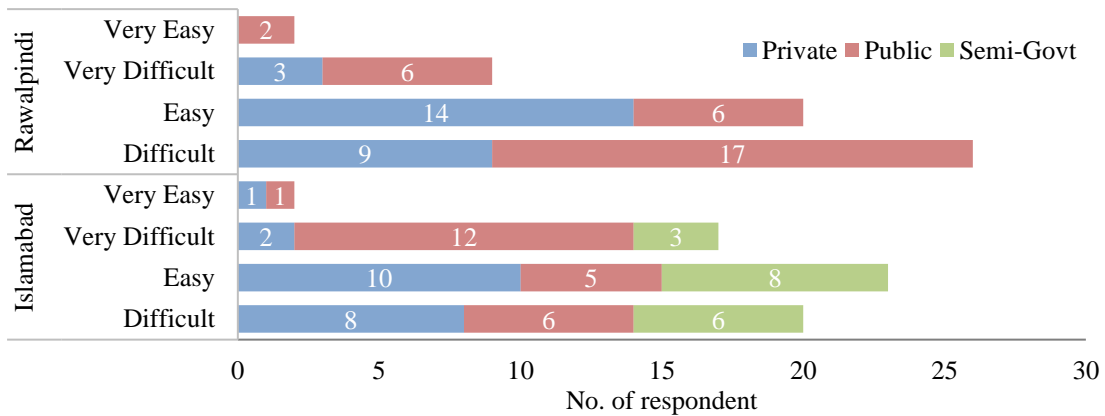


Figure 16: Is it easy and convenient to transfer the allotment (registry) of urban property?

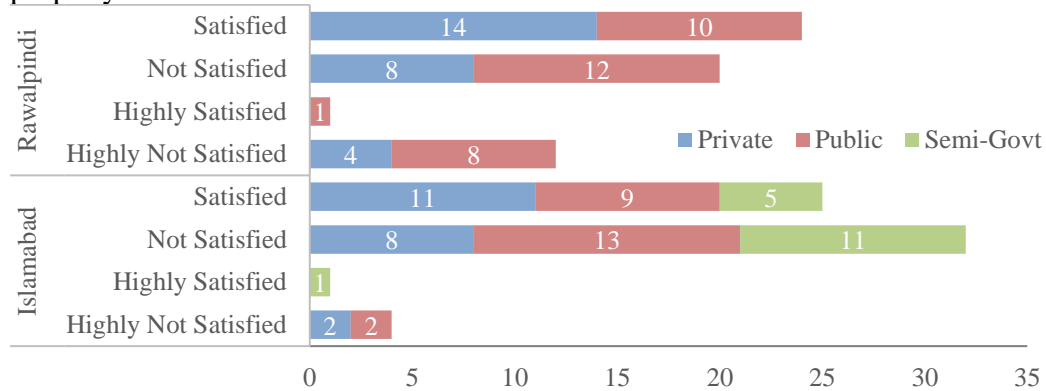


Figure 17: Are you satisfied with the allotment process (registry) and its transfer in urban areas?

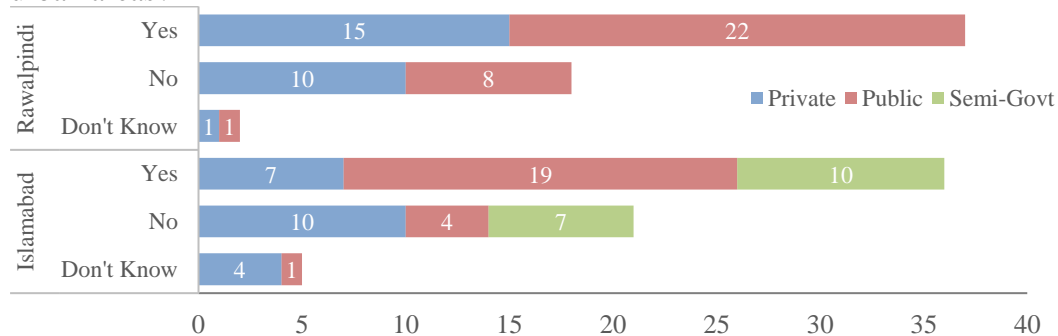


Figure 18: Have you faced long queues and delays for allotment and transfer (registry) of urban property?

4.2. SDG Target 2.3

Target 2.3 describes, “By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and

inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.”

In order to accomplish the target of ensuring secure and equitable land access for all, online and traceable digital transactions and convenient availability of land records are necessary. Most owner-buyers preferred the availability of land records in digital form, see Figure 19. More owner-buyers are not satisfied with the existing land record-keeping system. There are ongoing initiatives like LRMIS, PLUSE, and the creation of geospatial technology wings to upgrade and digitalize the records in the future. The LAS organization capacity is being upgraded to achieve the Target 3.2 by 2030.

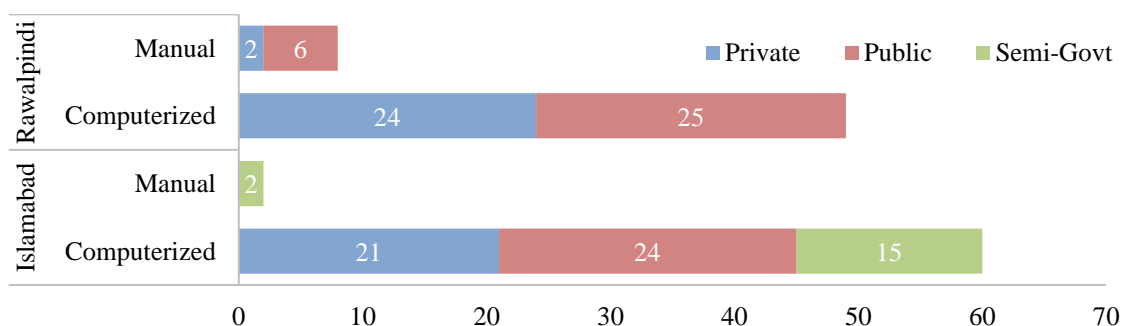


Figure 19: What is the preferred mechanism for urban property record keeping?



Figure 20: Are you satisfied that the current urban property record-keeping mechanism is safe and error-free?

4.3. SDG Target 5.a

SDG Target 5.a emphasis “Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.”

Women do not enjoy social rights and are marginalized in Pakistani society (Butt & Asad, 2016; Hussain & Jullandhry, 2020). They suffer from many social issues, including mandatory property ownership rights deprivation (Khaleel et al., 2023). Only 2.3% of women hold a managerial position (Govt of Pakistan, 2022). Legally, women are entitled to enjoy land rights.

The rights are vested through inheritance from their parents. For example, the share of two women is equal to a man for property inheritance transfer from their parents. Various laws exist in the country to achieve equal rights for women to access ownership and control over land and property; however, their implementation is poor. The awareness of land property rights and legal protection for women is also limited. The survey respondents said that there is an unavailability and lack of awareness of LAS-related laws and policies (see Figure 23 and Figure 22)

- Land Revenue Act (1967) Amendment 2012
- Muslim Personal Law (1962)
- The Partition of Immovable Property Act (2012)
- The Enforcement of Women's Property Rights Act (2020)

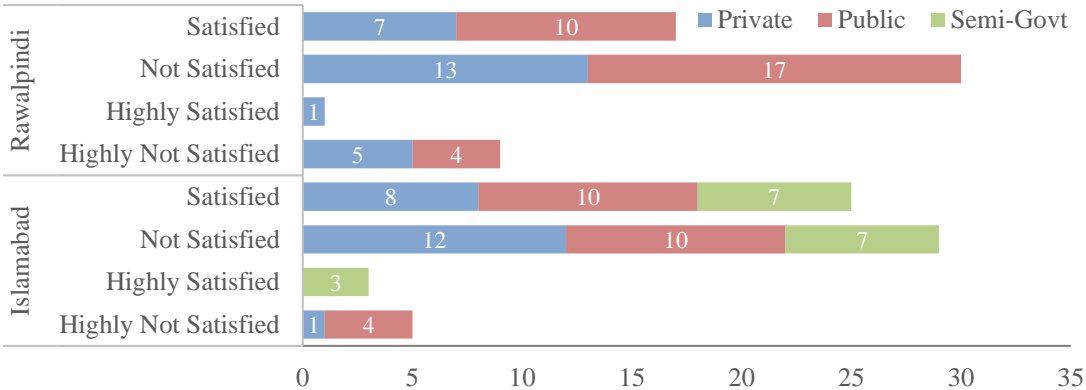


Figure 21: Are you satisfied with the laws and policies governing urban LAS?

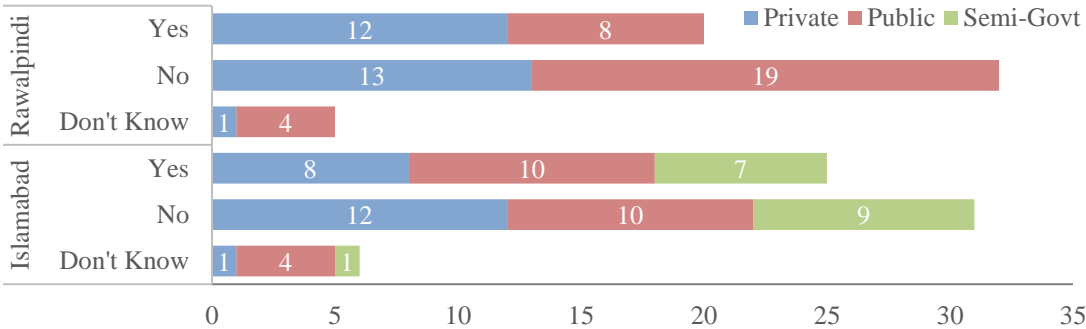


Figure 22: Is the information related to the laws and policies of your relevant organization available easily or online?

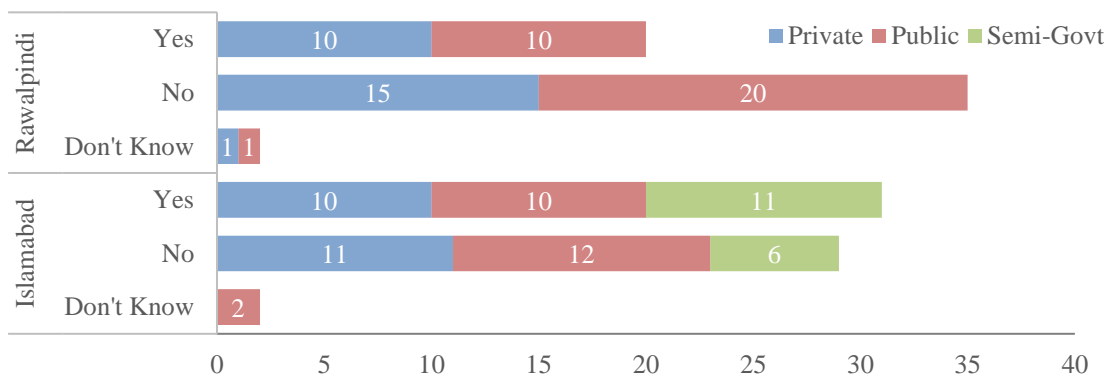


Figure 23: Are you aware of laws, rights, restrictions, and responsibilities related to your urban property?

4.4. SDG Target 8.2

Target 8.2 advocates “Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.”

Achieving decent work and economic growth through innovation and technological development is an important milestone. Pakistan is struggling with tax and revenue collection and falls behind in achieving the targets and unlocking the potential for economic growth (Ali & Imran, 2021; Hasan, 2022; Khan, 2021; Wani et al., 2020). Innovation and technology adoption can further alleviate the problem and support economic growth. Most of the owner-buyers agreed to adopt the computerization, GIS technology, and standards to improve the productivity of existing LASs (see Figure 24 and Figure 25)

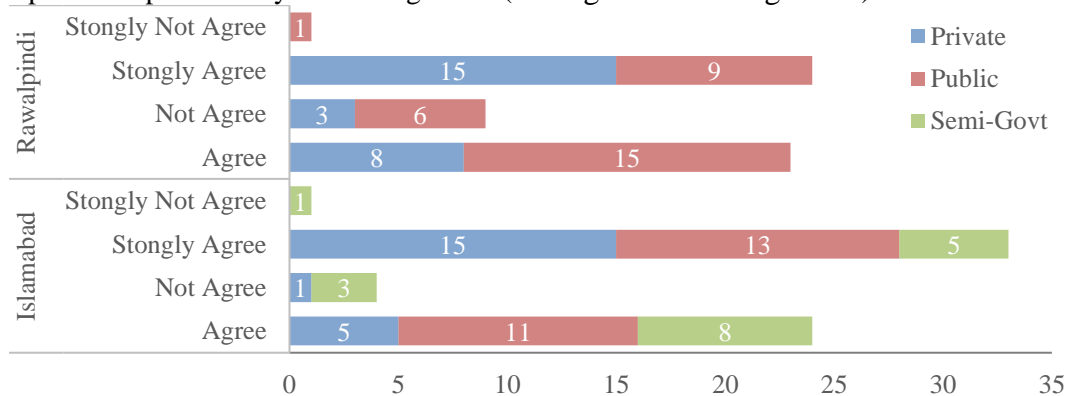


Figure 24: Do you agree that GIS and Computerization can solve the problems related to urban LAS?

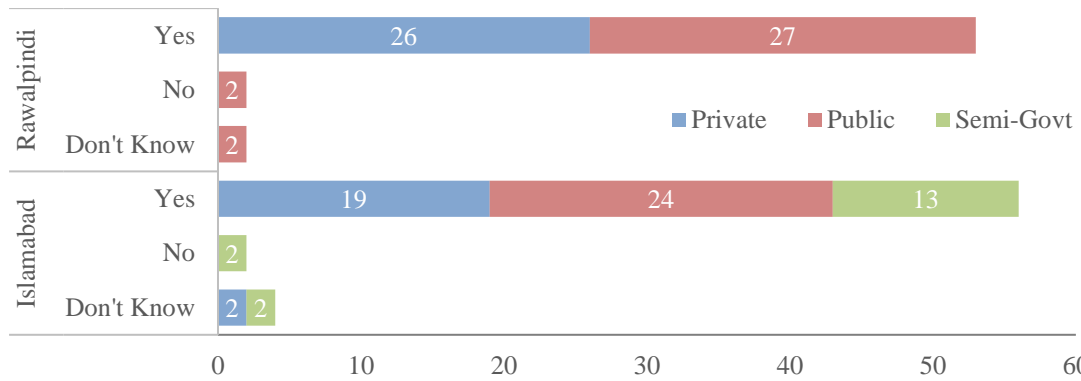


Figure 25: Do you agree that a national or international standard is required for synchronized and effective urban LAS?

4.5. SDG Target 11.1 and 11.3

Target 11.1 states, “By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums.”

Target 11.2 describes, “By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.”

Sustainable urban development in Asia is crucial as most of the future global urban development is anticipated in the region. To tackle the challenges and provide access to safe and affordable housing for all becomes an important goal. The currently manual nature of LAS has loopholes and issues in locating suitable land for affordable housing (Malik et al., 2020; Tariq et al., 2018; World Bank, 2022). In Pakistan, 56% of the urban population currently lives in slums (World Bank, 2020). There is a shortage of around 10 million housing units in the country. For example, the demand for 25,000 housing units in the capital city of Islamabad is being met with 3,000 units annually (ADB, 2024; CDA, 2020b; World Bank, 2022). Pakistan also lacks a participatory approach to urban planning and development (Hasan et al., 2021; Javed et al., 2020).

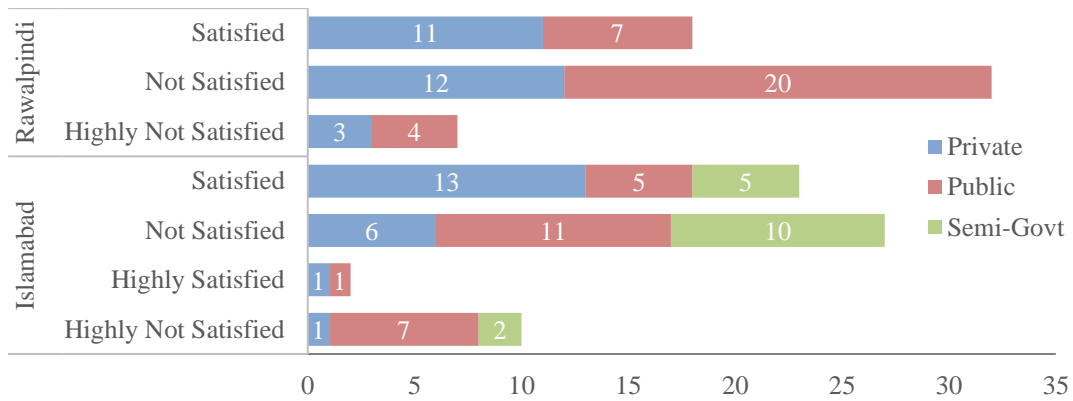


Figure 26: Are you satisfied with the existing urban LASs?

4.6. SDG Target 16.5 and 16.6

Target 16.5 underlines, “Substantially reduce corruption and bribery in all their forms.”

Target 16.6 advocates, “Develop effective, accountable and transparent institutions at all levels.”

The conventional LASs have been notorious due to corruption, where officials mainly exploit the manual nature of LAS (AGPR, 2017; Rahman, 2024). The survey responses also indicate the prevalence of corruption in LASs, especially under the government-controlled LASs, see Figure 27.

Developing effective, accountable, and transparent institutes, including LAS organizations in the country, is critical (Shabbir et al., 2020). The LAS stakeholders are facing issues, especially those dealing with organizations under government control (Ahsan et al., 2023; Ali et al., 2013). Many respondents strongly agreed that the ongoing computerization of LASs, especially the use of GIS, is important to ensure transparency and accountability in LAS operations.

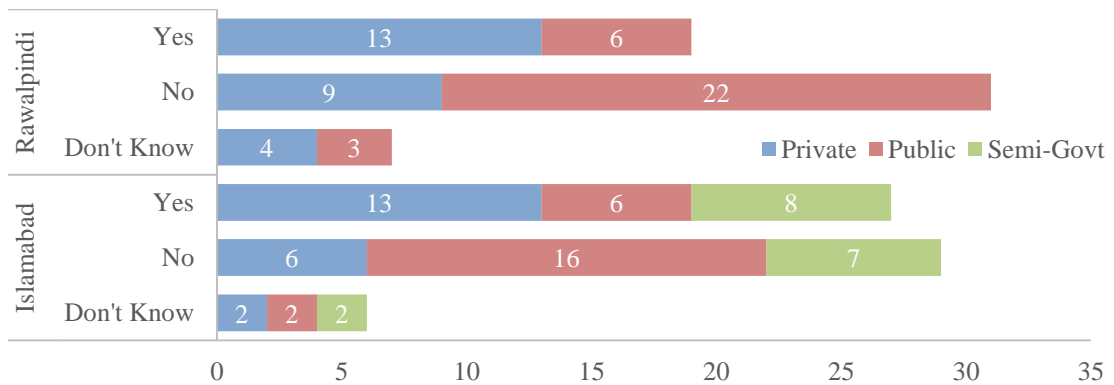


Figure 27: Is the process of urban property allotment and (registry) transparent and corruption-free?

4.7. SDG Target 17.1

Target 17.1 promotes “Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.”

The potential for tax and revenue related to land and property in the country is high; however, the collection is too low (Hasan, 2022; Khan, 2021; Wani et al., 2020). Upgrading the current manual LASs, improving their capacity, and mobilizing local resources in an integrated and efficient manner is critical

to strengthening domestic tax and revenue. The owner-buyers also said that the valuation of the property does not correspond to the property's actual market value, see Figure 28, resulting in revenue losses for the government.

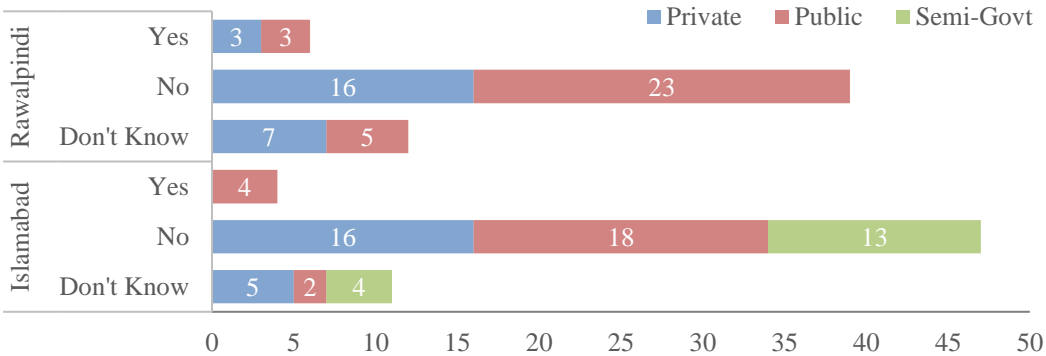


Figure 28: Does the DC rate for urban property valuation reflect the actual market price?

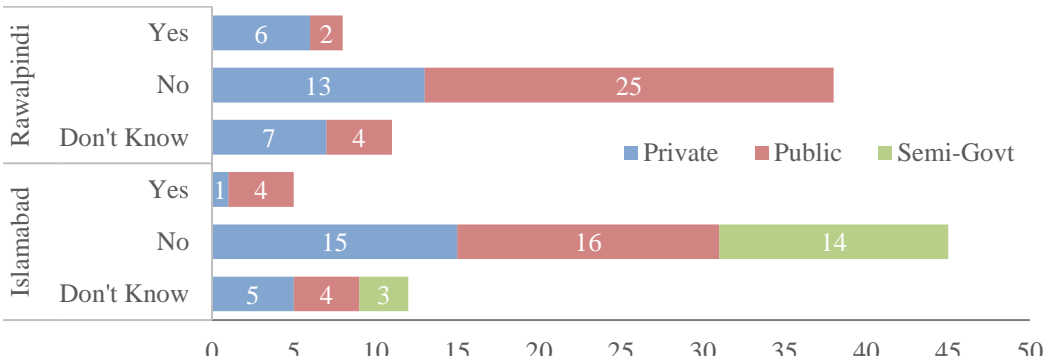


Figure 29: Does the FBR rate for urban property valuation reflect the actual market price?

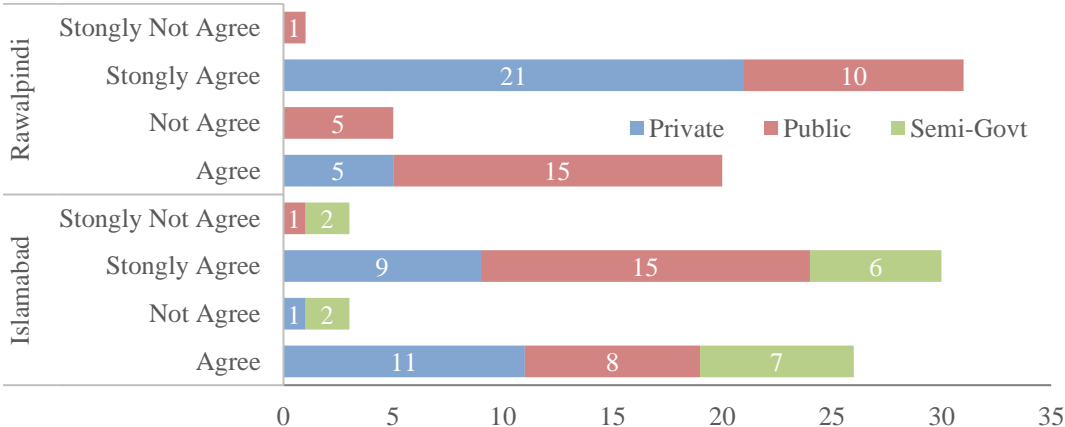


Figure 30: Do you agree that building more cooperation and partnership among stakeholders will help solve problems and increase the efficiency of urban LAS?

5. CONCLUSION

Urban LASs in Pakistan face challenges that result in dissatisfaction among owner-buyers. The issues include a lack of transparency, corruption, delays, long queues, non-implementation of laws, property undervaluation, and lack of awareness and access to property-related laws and policies. Interview respondents emphasized using computerization, GIS technology, and standardization to resolve the LAS issues and challenges. Pakistan is still struggling to achieve SDGs related to LAS in the country. There is a further need to review existing legal, technical, and institutional functions to meet the LASs' challenges. Considerable efforts are ongoing to upgrade existing LAS and achieve the SDGs in the near future.

REFERENCES

- Abbasi, K. (2024). CDA to decide fate of technology wing today. *DAWN*.
<https://www.dawn.com/news/1824045>
- ADB. (2024). *Pakistan National Urban Assessment: Pivoting toward Sustainable Urbanization* (Country Sector and Thematic Assessments, Issue).
<https://www.adb.org/sites/default/files/institutional-document/988626/pakistan-national-urban-assessment.pdf>
- AGPR. (2017). *Special Audit Report on the Accounts of Housing Societies Directorate Capital Development Authority (Private Housing Schemes in Islamabad Capital Territory)*. Islamabad: Government of Pakistan, Retrieved from
<https://www.agp.gov.pk/SiteImage/Policy/3.%20Special%20AR%20Housing%20Societies.pdf>
- Ahsan, M. S., Hussain, E., Ali, Z., Zevenbergen, J., Atif, S., Koeva, M., & Waheed, A. (2023). Assessing the Status and Challenges of Urban Land Administration System using Framework for Effective Land Administration (FELA): A Case Study in Islamabad. *Land*, 12(8). <https://doi.org/10.3390/land12081560>
- Ahsan, M. S., Hussain, E., Lemmen, C., Chipofya, M. C., Zevenbergen, J., Atif, S., Morales, J., Koeva, M., & Ali, Z. (2024). Applying the Land Administration Domain Model (LADM) for Integrated, Standardized, and Sustainable Development of Cadastre Country Profile for Pakistan. *Land*, 13(6), 883.
- Ahsan, M. S., Hussain, E., Lemmen, C., Zevenbergen, J., Atif, S., Chipofya, M., Ali, Z., Morales, J., & Koeva, M. (2024). Deriving Requirements for Integrated and Standardised Cadastre Profile from the Legacy Board of Revenue and the Contemporary Land Administration Systems. *Survey Review*.
<https://doi.org/10.1080/00396265.2024.2351624>
- Ali, A., & Imran, M. (2021). National Spatial Data Infrastructure vs. Cadastre System for Economic Development: Evidence from Pakistan. *Land*, 10(2), 188.
<https://doi.org/https://doi.org/10.3390/land10020188>
- Ali, Z. (2013). *Developing a framework to apply Total Quality Management concepts to land administration: the case of Islamic Republic of Pakistan* University of Twente,]. Enschede. http://www.itc.nl/library/papers_2013/phd/zali.pdf

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Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights

Kathmandu, Nepal, 14–16 November 2024

- Ali, Z., & Nasir, A. (2010). Land administration system in Pakistan—current situation and stakeholders' perception. *Framework*, 11, 16.
- Ali, Z., Zevenbergen, J., & Tuladhar, A. (2013). Quality assessment of the land administration system in Pakistan. *Journal of Spatial Science*, 58(1), 119-146.
- Baden-Powell, B. H. (1892). *The land-systems of British India* (Vol. 1). Clarendon Press.
- Butt, B. I., & Asad, A. Z. (2016). Refutation, Relinquishment and Inheritance: Exploring Women's Inheritance Rights in Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 36(2).
- Islamabad Capital Territory (Zoning) Regulation 2005, (2005).
<https://www.cda.gov.pk/documents/docs/bcs-2005.pdf>
- CDA. (2020a). *Capital Authority Organogram*. Islamabad: CDA Retrieved from
<https://www.cda.gov.pk/documents/docs/CDA-Organogram.pdf>
- CDA. (2020b). *Review of Master Plan of Islamabad (2020-2040) Prepared by Federal Commission (Interim Report)*. Islamabad: Gazette of Pakistan Retrieved from
<https://www.cda.gov.pk/documents/docs/masterPlanInterimReport2020.pdf>
- CDA. (2023). *Illega;/Un-authorized housing schemes in Islamabad*. Islamabad: Capital Development Authority, Retrieved from
https://www.cda.gov.pk/housing/unauthorised_schemes.asp
- DAWN. (2021). Ordinance transferring CDA wings to MCI challenged. *DAWN*.
<https://www.dawn.com/news/1665616/ordinance-transferring-cda-wings-to-mci-challenged>
- Enemark, S. (2006). Understanding the land management paradigm. Proceedings: Innovative technology for land administration, Madison, Wisconsin, United States.
- Enemark, S., Williamson, I., & Wallace, J. (2005). Building modern land administration systems in developed economies. *Journal of Spatial Science*, 50(2), 51-68.
<https://doi.org/https://doi.org/10.1080/14498596.2005.9635049>
- FAO. (2002). *Land Tenure and Rural Development*. Food and Agriculture Organization (FAO). <https://www.fao.org/3/y4307e/y4307e00.htm#Contents>
- Govt of Pakistan. (2022). *Pakistan's Voluntary National Review: Implementing Best Practices to Build Forward Better in Decade of Action*. Islamabad: Ministry of Planning Development and Special Initiatives Retrieved from
<https://www.pc.gov.pk/uploads/report/VNR-v9.pdf>
- Govt. of Punjab. (2024). *Private Housing Societies in Punjab*. Government of Punjab. Retrieved 05-May from <https://ahs.punjab.gov.pk/>
- Hasan, L. (2022). Strategies to Improve Revenue Generation for Islamabad Metropolitan Corporation. *The Pakistan Development Review*, 61(3), 511-517.
<https://thepdr.pk/index.php/pdr/article/view/3000/2444>
- Hasan, L., Chaudhry, A., Ahmad, A., & Jalil, H. (2021). *Slums, Sprawl and Contemporary Islamabad-A Doxiadis' Mess*. M. P. R. Archive. <https://mpr.ub.uni-muenchen.de/108735/>
- Hussain, S., & Jullandhry, S. (2020). Are urban women empowered in Pakistan? A study from a metropolitan city. Women's Studies International Forum,
- Javed, N., Hasan, R., & Qureshi, N. N. (2020). Developing a national urban policy: a case study of Pakistan. In D. Kundu, R. Sietchiping, & M. Kinyanjui (Eds.), *Developing*

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Kathmandu, Nepal, 14–16 November 2024

- National Urban Policies: Way forward to green and smart cities* (pp. 121-146). Springer. <https://doi.org/https://doi.org/10.1007/978-981-15-3738-7>
- Karra, K., Kontgis, C., Statman-Weil, Z., Mazzariello, J. C., Mathis, M., & Brumby, S. P. (2021). Global land use/land cover with Sentinel 2 and deep learning. 2021 IEEE international geoscience and remote sensing symposium IGARSS,
- Khaleel, B., Ahmed, K., & Shah, S. S. A. (2023). Critical Discourse Analysis of Pakistani Inheritance Law and Justice System for Women. *Pakistan Social Sciences Review*, 7(3), 87-100. [https://doi.org/10.35484/pssr.2023\(7-III\)08](https://doi.org/10.35484/pssr.2023(7-III)08)
- Khan, M. I. (2021). *Property Tax Mapping and Assessment Using GIS: Case study of Rawalpindi City* Lund University,]. Swedon.
- MCI versus CDA W.P. No.4298/2019, (Islamabad High Court 2020). http://mis.ihc.gov.pk/attachments/judgements/110977/1/WP-4298-2019_____637444100081996993.pdf
- Malik, S., Roosli, R., Tariq, F., & Yusof, N. a. (2020). Policy framework and institutional arrangements: Case of affordable housing delivery for low-income groups in Punjab, Pakistan. *Housing Policy Debate*, 30(2), 243-268. <https://doi.org/10.1080/10511482.2019.1681018>
- Nayak, P. (2020). *Land Reforms to Land Titling: Emerging Paradigms of Land Governance in India*. Sage Publications Pvt. Limited.
- The West Pakistan Muslim Personal Law, Gazette of Pakistan (1962). <http://punjablaws.gov.pk/laws/135.html>
- Land Revenue Act 1967, Act No. XVII OF 1967 Government of Pakistan (1967). http://punjablaws.gov.pk/laws/212.html#_ftn2
- The Partition of Immovable Property Act, Gazette of Pakistan (2012). <http://punjablaws.gov.pk/laws/2528.html>
- Islamabad Capital Territory Local Government Act 2015 Government of Pakistan (2015). <https://pakistancode.gov.pk/pdf/files/administrator2cd0fb199558bc5fb239d66d51d21e27.pdf#viewer.action=download>
- The Enforcement of Women's Property Rights Act Government of Pakistan (2020). <https://pakistancode.gov.pk/pdf/files/administrator080fe2813f4e31fb566cb0385a414fe1.pdf>
- Islamabad Capital Territory Local Government Act 2021 Government of Pakistan (2021). https://na.gov.pk/uploads/documents/61e7f9e1779c1_389.pdf
- Payne, G. (2001). Urban land tenure policy options: Titles or rights? *Habitat international*, 25(3), 415-429. [https://doi.org/https://doi.org/10.1016/S0197-3975\(01\)00014-5](https://doi.org/https://doi.org/10.1016/S0197-3975(01)00014-5)
- PBS. (2024a). *7th Population and Housing Census - Detailed Results*. Islamabad: Pakistan Beurue of Statistics Retrieved from <https://www.pbs.gov.pk/digital-census/detailed-results>
- PBS. (2024b). *7th Population and Housing Census: First Ever Digital Census Key Findings Report*. Islamabad: Ministry of Planning Development and Special Initiatives, Government of Pakistan Retrieved from https://www.pbs.gov.pk/sites/default/files/population/2023/Key_Findings_Report.pdf
- PLRA. (2024). *PLRA Organogram*. Punjab Land Records Authority. Retrieved 19 August from <https://www.punjab-zameen.gov.pk/Organogram>

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FIG Regional Conference 2024 - Nepal

Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights

Kathmandu, Nepal, 14–16 November 2024

- Rahman, T. (2024). Shaky ground: the fraud of property in Lahore. *City*, 1-12.
<https://doi.org/10.1080/13604813.2024.2322786>
- Robinson, F. H. (1856). *An Account of the Land Revenue in British India*. W Thacker & Co.
- Sengupta, A., Lemmen, C., Devos, W., Bandyopadhyay, D., & Van der Veen, A. (2016). Constructing a seamless digital cadastral database using colonial cadastral maps and VHR imagery—an Indian perspective. *Survey Review*, 48(349), 258-268.
- Shabbir, M., Shahid, M., Atif, M., & Niaz, U. (2020). Land Record Computerization brings more Trouble for Farmers in Punjab, Pakistan. *Journal of Business and Social Review in Emerging Economies*, 6(2), 753-760. <https://doi.org/10.26710/jbsee.v6i2.1216>
- Tariq, F., Salman, M., Hasan, J., Zafar, Z., Malik, S., Nawaz, M., Gul, A., & Sheikh, N. B. (2018). Appraisal of national housing policy-a case of Pakistan. *Technical Journal University of Engineering and Technology (UET) Taxila*, 23(03), 1-8.
<https://tinyurl.com/mpeuryte>
- Unger, E.-M., Bennett, R. M., Lemmen, C., & Zevenbergen, J. (2021). LADM for sustainable development: An exploratory study on the application of domain-specific data models to support the SDGs. *Land Use Policy*, 108, 105499.
- Wani, S., Shaikh, H., & Harman, O. (2020). Urban property taxes in Pakistan's Punjab [Policy Brief].
- World Bank. (2020). *Population living in slums (% of urban population)* World Bank,.
<https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?end=2020&locations=P&K-IN-BD&start=2000&view=chart>
- World Bank. (2022). *Pakistan - Punjab Urban Land Systems Enhancement Project* (PAD3906).
<http://documents.worldbank.org/curated/en/697141647441927504/Pakistan-Punjab-Urban-Land-Systems-Enhancement-Project>

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Assessing Urban Land Administration Capacity to Achieve 2030 Agenda for Sustainable Development in Pakistan (12905)

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