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LAND ADMINISTRATION AND ITS DIGITAL SHIFT IN BANGLADESH AND TÜRKİYE: A COMPARATIVE ANALYSIS

*** Md Moynul AHSAN**

Ankara University, Faculty of Applied Sciences, Real Estate Development and Management Department, Ankara, TÜRKİYE
moynulurp01@gmail.com

Highlights

- Bangladesh is making progress on land management, but desired progress is not satisfactory whereas Türkiye is making significant progress on its land management and its economy.
- Digital land management practices of Türkiye are now in reality whereas Bangladesh is a way of reality and seems very challenging.
- A robust governance system is vital for both countries.

***Corresponding Author:** Md Moynul AHSAN, moynulurp01@gmail.com

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ABSTRACT: This study has focused on the land administration practices in Bangladesh and Türkiye, covering existing state, institutional structure and relevant policies followed in the past two decades. A major focus has been given to the shift from manual to digital land administration practices in both countries. By using an explanatory qualitative analysis through secondary based data and information, it has found that the governments of Bangladesh and Türkiye are aiming to make the country's land management system fully digitalised and bring land services to the doorsteps of people to ensure proper land utilisation/entitlement as per targets of Sustainable Development Goals. It has found that Bangladesh is achieving progress, but the desired progress is not satisfactory, whereas Türkiye is achieving successive progress and now considered is one of the best practised countries in the world. The country is making significant contribution in its economy through land management practices. Digital land administration practices of Türkiye are now in reality while Bangladesh is a way of reality and seems very challenging as it requires robust administration and sufficient human resource mobilisation. Bangladesh also needs a centralised administrative system, more user friendly one stop services, capacity building activities, and modern technology-based practices. Finally, a robust governance system by ensuring land crime prevention and redress is a vital need for both countries.

Keywords: *Land Administration, Land Planning, Digitalisation, Land Governance, Bangladesh, Türkiye*

1. INTRODUCTION

"Land - a natural asset" encompasses all physical elements, to a specific area or piece of property, identity etc. (Mahalaya, 2010). It is a scarce resource and consider as a primary factor of production. The scarcity of land, increasing demand, and resulting high prices poses important implications for the prospect of industrialization and development of a country (Raihan et al., 2020). The existing urbanization trends, future demographic demands, environmental and climatic change, green transition effort, value creation, availability and use of open data etc. all creates a significant demand for digital transition (FAO, UNECE and FIG. 2022). Land requires sustainable planning, use and management in order to meet the present and future needs (Uisso et al., 2022). Its sustainable practices with a data and knowledge-driven and modern technology-based procedure can meet the rising development demand of the people in the planet. Its administration and management is a profound issue for every developing country in the world. Considering its importance, the United Nations has put emphasis on land in its Sustainable Development Goals (SDGs) (UN, 2020), as a major concern for development of a country. It has estimated that more than 70% of the targets are related to geospatial technologies and land administration (Ercan, 2022). The SDG 15 regarding "Life on Land" has explicitly discussed on land and land related issues. Among the 17 SDG goals eight of them are directly and indirectly discussed on land and its management, administration and related issues. Land tenure or land right is explicitly linked to poverty eradication (SDG1), food security (SDG2), and gender equality and women's empowerment (SDG5) and some goals have implicit links to land-related outcomes (Heider & Connelly, 2016), and therefore, countries should perform explicit role on land administration and planning for their sustainable development.

The land issues are extremely complex and can be relieved by deploying "digitalised" based practices.

***Corresponding Author:** Md Moynul AHSAN, moynulurp01@gmail.com

Globally, land offices in many countries are still noticeable due to traditional analog service methods. Countries could not perform precise role on land related issues for their sustainable development. The automation of services is one method for solving these traditions. However, all land services must be automated through coordination with related services provided by other ministries and stakeholders using top-notch, interoperable software and apps. A digitalised system could ease monitoring and evaluation of various major activities on land administration, including land registration and transfer, title deeds etc. It could represent highly effective in the market-based economies and could ensure good governance by curbing corruption, ensuring transparency and accountability, maintaining rule of law.

Being a developing country, Bangladesh is characterised one of the densely populated countries in the world with 1301 people per square kilometers (sq.km) in 2021 in its 147,570 sq.km of land mass (World Bank, 2024c). The country occupies around 0.03% of the world's land area but it supports slightly over 2% of the world's population. On the other hand, Türkiye is also a developing country located around 97% in Western Asia comprising around 90% of the country's population, and the remaining 3% portion located in the European part comprising around 10% of the country's total population. The country is characterised as a less densely populated country in the world with 109.3 people per sq.km in its 783,600 sq.km of land mass (World Bank, 2024c), which represents around 12 times less than Bangladesh. The following table 1 shows a brief comparison of general characteristics in Bangladesh and Türkiye.

Table 1. General characteristics in Bangladesh and Türkiye.

Characteristics	Bangladesh	Türkiye	Remarks
Area (sq. km)	147,570	783,600	Türkiye is 5.04 times bigger than Bangladesh
Population (in million)	165.2	84.98	Bangladesh population is around 2 times bigger than Türkiye
Urban population (% of total population)	31.66	77	Still more than two-third of the population of Bangladesh are living in rural area
Land Parcels	No exact data received	Approximately 59 million	Around 45 million land record available in Bangladesh
Province/district	64	81	District and Province are interchangeable
Upazila	495	973	Upazila and District are interchangeable
Villages	90,049	18,253	Only 6.8% people live in villages in Türkiye

Source: World Bank, 2024a; TURKSTAT, 2022; BBS, 2024

From the above characteristics, including data and information, it has found that Türkiye's land-man ratio is about 5 times bigger than Bangladesh, but Bangladesh's population is more than 2 times bigger than Türkiye. Therefore, land management, its planning and administrative actions are much more challenging for Bangladesh. In Türkiye, a major proportion of people are living in urban areas whereas Bangladesh's population are living predominantly in rural areas. Around 86.51% land area is considered as rural and the remaining 13.49% is urban in Bangladesh (BBS, 2024). As per World Bank (2024a), the Urban population (% of total population) in Türkiye is 77% whereas only 6.8% people live in villages in Türkiye (TURKSTAT, 2022), and the remaining 93.2% population are living in urban areas.

Considering the importance of land administration, the Bangladesh government has identified 'land' as one of the priority development areas of intervention in its various long-term development plans such as Perspective Planning 2021-41, Delta plan 2100 etc. The Article 42(1) of the Constitution of Bangladesh has provided land rights to the individual. It states that "*Subject to any restrictions imposed by law, every citizen shall have the right to acquire, hold, transfer or otherwise dispose of property, and no property shall be*

compulsorily acquired, nationalised or requisitioned save by authority of law" (Ministry of Law, Justice and Parliamentary Affairs, 2019).

On the other hand, Türkiye government is giving importance of land administration and planning (more specifically digital land administration) as per of its development policies and activities. The country has poses land rights to the individual. The Article 35 of the Constitution of the People's Republic of Türkiye has been stated that "*Everyone has the right to own and inherit property. These rights may be limited by law only in view of public interest. The exercise of the right to own property may not be in contravention of the public interest*" (Department of Laws and Resolutions, 2019).

Türkiye now, is practicing land management issues through its digitalized administration systems whereas Bangladesh government aims to digitalize its land administration system and making some progress from the last decade. As per the World Bank, Türkiye is one of the best practising land management and administrative countries in the world (World Bank, 2020) and is making significant contribution through its digitalise land management system at the national and international level.

As the world is moving towards a digitalised system, which contributes all aspects of our life, where land issues are vital. In this conjunction, countries also urge to improve their land administration services, better decision making, better security, minimise dispute, fairer taxation, good governance in both urban and rural areas (FAO, UNECE and FIG. 2022). Therefore, comparing countries in land administration practices and its digital effort from the past decades could make beneficial role for the development of a country. Both Bangladesh and Türkiye pose a long history of land laws and policies from ancient periods, and their digital movement could be visible from the past two decades, therefore focusing these countries on land administration and management can contribute the administrative and managerial practices more efficient and further effective action. Considering this background, Bangladesh and Türkiye case has been considered in this study, and outlined to find out the existing state, challenges and opportunities for land administration and management practices in both countries.

2. MATERIAL AND METHODS

In this study, an explanatory qualitative analysis through secondary based data and information conducted in order to gain the insights relying on the findings gained. Content analysis was applied to gather data based on secondary based research such as government published reports from Bangladesh Bureau of Statistics (BBS), Turkish Statistical Institute (TURKSTAT), General Directorate of Land Registry and Cadastre (GDLRC); non-government reports, peer-reviewed articles, books etc.to understand the land administration practices in Bangladesh and Türkiye. There are many crosscutting issues that could be considered in land administration and management but this study is mainly focused on several priority areas of development such as: land registration, administration and digital transition in both countries. The following table 2 outlined to express methodological correlation in this study:

The land administration in Bangladesh has a long history that dates back to systems developed by the Ayra, Hindu, and Muslim rulers of ancient India (Raihan et al., 2020); later on, British colonial and Pakistan period, and presently the Republic of Bangladesh. On the other hand, Türkiye also poses a long history of land administration that dates back to the Ottoman period and the present Republic of Türkiye. Though both countries are posing long history of land, laws, planning and policies dates back to the ancient period but this study has focused on the governmental action after 2000; more specifically, Bangladesh former Prime Minister Sheikh Hasina's came to power in 2009 and Turkish President Recep Tayyip Erdoğan's came to power in 2002, as both government has expressed their urgency of shift in land management practices from manual to digital.

Table 2. Methodological correlation of the study

	Contents	Technique
Research questions and objectives	• What existing land administration are practices available in Bangladesh and Türkiye? • Are the existing practices, more especially digital transition sufficient to overcome land administrative problems? • Are Turkish land administration practices applicable in Bangladesh and vice versa? • What necessary actions needed to overcome the challenges?	Insights of providing the state of land, existing institutional structure, governmental intervention in digital perspectives and insights,
Data collection	Secondary based	Reliable sources of gray literature, peer-reviewed article, book etc.; data and reports
Data analysis	Content analysis	Land, land distribution, institutions, existing structure, digitalization efforts, and challenges
Verification of results	Analytical generalizability of land administration and digital issues	Manual to digital practices, performance

3. FINDINGS AND ANALYSIS

3.1. State of Land

Bangladesh is primarily a low-lying country. The human interaction on land is very high especially in land transfer and conversion. The country is rapidly losing arable land due to growing industrialization, economic development, urbanisation, urban sprawl-based development, lack of proper planning and plan implementation (Ahsan & Rahman, 2013). Land speculation, grabbing, disputes all are frequent events in Bangladesh (GED, 2020). The private investors, real estate developers intensify the exploration of availability of land in the city periphery areas or remote areas to set up factories or housing projects (Mahmood & Ahsan, 2019) leads to a hike of residential, commercial/industrial or even agricultural land. The scenario could be visible in all big cities in the country. A consequence of farmland depletion is creating another dimension of involuntary relocation and migration (Mahmood & Ahsan, 2019) in Bangladesh. In addition, the increasing climate change impacts on land are aggravating development concerns in Bangladesh (Ahsan, 2019). It creates increasing pressure on land and resulting various impacts such as drought, desertification, degradation, loosing land-based ecosystems and so on.

In addition, the countries land-man ratio is one of the lowest in the world, estimating around 0.06 hectares per person (World Bank, 2022). The arable land (hectares per person) was 0.16 in 1961, showing a downward trend over the years and in 2021 it reached only 0.05 (World Bank, 2024a). Due to governmental interventions, the agricultural land (% of land area) has increased from 70.1% in 2011 to 77.3% in 2021 (World Bank, 2024b). The following table 3 shows the size-wise distribution (% share in number of total farm holdings) of farm holdings in Bangladesh.

Table 3. Distribution of farm holdings by size in Bangladesh

Small (in acre)					Medium (in acre)	Large (in acre)	Total
0.05-0.49	0.50-0.99	1.00-1.49	1.50-2.49	**Total**	2.50-7.49	7.50+	**Total farm holdings**
%28.0	%23.8	%16.4	%16.3	%84.4	%14.1	%1.5.0	%100.0

Source: BBS, 2018

On the other hand, Türkiye represents a flat alluvial plain of land with almost 29.4% classified as forest land (OGM, 2020). Like Bangladesh, here human interaction on land is high especially in land transfer, selling and conversion. Though the situation is not similar to Bangladesh, but the country is also losing arable land due to growing industrialization, economic development, gentrification, urban sprawl-based development, climate change impact etc. (Ahsan, 2022). More specifically, private and cooperative investors' investment in the land and real estate sector are making intense speculation of residential, agricultural, commercial and industrial land.

The agricultural land (% of land area) of Türkiye has reduced slightly in proportion to Bangladesh from 49.7% in 2011 to 49.5% in 2021 (World Bank, 2024b). The land-man ratio is 0.23 hectares per person, which is around 5 times bigger than Bangladesh. Unlike Bangladesh, the arable land (hectares per person) poses a downward trend from the past, in 1961 it was 0.81 and in 2021 it became only 0.24 (World Bank, 2024a) (Table 4).

Table 4. Farm size distribution in Turkish agriculture (in % of total farms)

Farm size (in ha)	Year (% of total farms)	
	1991	2001
0-2	35.8	33.4
2-5	31.0	31.5
5-10	17.8	18.5
10-20	9.8	10.8
20-50	4.6	5.1
Above 50	0.9	0.7

Source: EC, 2006 (No updated data received)

According to a study by Ercan (2024), a significant 98.2% of holdings consist of land areas ranging from 5 to 499 hectares, with 77.5% falling within the 20-to-499-hectare range. On average, each agricultural holding contains 5.9 parcels of land, and the average parcel size for agricultural land is 12.9 decares (Ercan, 2024).

3.2. Institutional structure

Bangladesh's current land administration and management system includes three main components: settlement, registration, and record keeping (GED, 2022). The Ministry of Land (MoL), the Ministry of Law, Justice and Parliamentary Affairs (MLJPA), the Ministry of Public Administration (MoPA), and the Ministry of Housing and Public Works (MoHPW) are the four Ministries in Bangladesh that carry out this land management and administration. However, MLJPA and MoL continue to carry out the fundamental duties of land administration. The Ministry of Land (MoL) is responsible for land administration through its various divisions such as Land Record and Survey Department (LRSD), Land Reform Board (LRB), Land Appeal Board (LAB) and Land Administration Training Centre (LATC); and the Directorate of Registration under the Ministry of Law, Justice and Parliamentary affairs (MLJPA) is responsible for changes in ownership and taxation (MoL, 2023). The MoL performs most land-related activities including land record surveys, collection of land development tax, and arbitration process, the MLJPA mainly performs records land mutation and transfers. Considering the case of digital land management in Bangladesh, the Land Record and Survey Department (LRSD) is the major responsible organisation performing with its 3 wings: Administration, Land Records and Survey. There is no notary system. Like GDLRC in Türkiye, there is no Research Planning and Coordination Department or Information

Technology Department or Inspection board or internal audit department. The land management system in Bangladesh still largely conventional and old-fashioned, marked by inefficiencies and a lack of implementation of modern policies (Masum, 2017; Raihan et al., 2024). Efforts to better management of land sector are ongoing, but insufficient progress due to entrenched interests and institutional complexities (Raihan et al., 2024).

However, the land administration system in Türkiye is characterised by a structured approach involving planning, cadastre, and real estate valuation, supported by digitalization efforts (Sürmeneli, 2024; Ercan, 2024). The country is following a centralised administration system through General Directorate of Land Registry and Cadastre (GDLRC) (*Tapu ve Kadastro Genel Müdürlüğü*- TKGM) under the Ministry of Environment, Urbanisation and Climate Change so that they can plan, execute and ensure the renewal and updating cadastral work of immovable property as well as to create land register, ensuring the archiving and protection, mapping, to determine production standards and to ensure archiving (GDLRC, 2010). The GDLRC is the main government body of land registry and cadastre. Land registry and cadastre are managed and carried out by one organisation i.e., centralised management. There are 1,101 Units in the Central and Provincial Organization with 19,404 staff. Around 9 million transactions are happening per year. It approximately served 25 million citizens and the annual revenue is around 2 billion USD (Adlı, 2019). There were no provisions of the notary system in the past but from 2023 Notary Public could also receive the applications.. As part of the changing and developing conditions, it has transformed the Research Planning and Coordination Department into the Information Technologies Department, and it strengthened its organisational structure by establishing the Land Valuation Department in 2019.

3.3. Government Intervention: A Shift from Manual to Digital Land Administration and Planning

The human interaction on land in Bangladesh and Türkiye is very high. Digitalisation reduces human interaction, so it represents itself as a tool for successive development of a country. However, proper digital transformation requires a holistic approach. As it should incorporate all relevant stakeholders and align with national policy agendas (FAO, UNECE and FIG, 2022). Both Bangladesh and Türkiye are practising digital land management to reduce the harassment, delays, complexities, and other related problems as well as ensure proper governance and planning of land related activities. In this study, digital shifts have focused on new digital practices or movements that are staying on the innovation and ensuring proper land administration.

3.3.1. Bangladesh Case

The Bangladesh government now is transitioning from a paper-based system to a cloud-based multi-channel approach, focusing on user-friendly web and mobile applications to streamline land administration and reduce fraud (Pereira et al., 2018; Talukder et al., 2014). In this connection, the government of Bangladesh approved a Tk 3.37 billion (397,895,144 USD) project in 2020 to prepare a digital database for ensuring a transparent land administration system in the country. The Law Commission of Bangladesh has published a draft legislation called 'Bangladesh Land Act 2020' with an aim to bring uniformity in land management and land administration in Bangladesh. Major reforms focus on computerization of land records, simplification of land transactions and land registration etc. as land registration is considered as a revenue generator as it applies various fees, charges during its transactions to make the process more transparent. In 2021, the government has adopted the 'Land Crime Prevention and Redress Act, 2023' was enacted to prevent land fraud and miscellaneous crimes relating to illegal possession and title of land. The previous laws on land reforms and land development tax reformulated as the Land Reforms Act, 2023 and the Land Development Tax Act, 2023 to delineate the provisions on land ceiling, banning anonymous transactions; distribution of government lands for landless, sharecropping and taxes. Government has also adopted 'Land Use Act 2021' to ensure planned use of land. These laws will help to protect agricultural land/farmland, ensure food security, and reduce the

negative impacts of climate change. Again, the Land Development Tax Act, 2023 will help to provide free online land rent for harassment where citizens can be able to pay directly with a National Identity Card.

Through the inclusion of four pillars (Smart Citizen, Smart Society, Smart Economy, and Smart Governance), the government hopes to fully automate the land management system in the country and deliver land services to residents' doorsteps as part of Smart Bangladesh Vision-2041. The government of Bangladesh is implementing several initiatives like Smart Land Map, Smart Land Records, Smart Land Pedia, Smart Land Service Center, and Modern Land Offices at 400 upazilas nationwide.

As part of the digitalization move, the Bangladesh government established a task force to digitize the land registry and management sector in 2008. The Sheikh Hasina government of Bangladesh started digitization of land services in 2009. A thorough concept paper was prepared in 2016, and the digitalization was initiated in stages under different projects both centrally and locally at district and upazila (sub-district) level. In 2018, the Ministry of Lands introduced an *e-Namzari (e-mutation)* system. The outline for digitising the land service was prepared in 2021, and as a result the digitization of the entire land service (*Bhoomiseba*) system and administration started centrally. The land services digitization program involves more than just switching to an electronic system and maintaining the manual service delivery process. The Ministry of Land began action to finish the first phase of the process of continuing the sustainable reform of the asymmetric land service system by 2026 that dates back hundreds of years. In 2020 the government of Bangladesh started to prepare a digital database for the country. In June 2024, the Ministry of Land started using government funds exclusively to carry out the plot-based and *mouza*[1]-based nationwide digital land zoning project. In total 64 districts across the nation, the project will encompass around 56,348 mouzas under 4,562 unions of 493 upazilas (Khan, 2020). It indeed needs to be used judiciously and the management system of Bangladesh's land should be maintained in a planned way. On March 9, 2022, The Ministry of Land released a tender for 'Land Management Automation Project' and 'Capacity Development of Land Records and Surveys to Perform Digital Survey Project' in 2021.

When a piece of land is bought, sold, or transferred, the *Khotian*[2] or Pamphlet is one of the most crucial documents proving ownership. It is getting harder to keep the records in the record rooms because they are so old and worn out. The existing records are so feeble that they cannot be captured or tricked, especially given the age of the Cadastral Survey (CS) records, which is causing harm to them (Khan, 2020).

In 2020, the government launched the Digital Land Records (*e-Porcha*) system; nearly 4.5 crore ledgers have been digitalised. Therefore, citizens can now access and retrieve their land records online, provided they have paid the required fees, from any location in the world (Khan, 2020).

In the past, land tenure security is often undermined by complex registration systems in Bangladesh, which could lead to disputes and hinder agricultural productivity. The present land record digitization process follows a decentralised system where digitalisation will be available in three nodal offices: land registration, Assistant Commissioner of land and Deputy Commissioner of districts. This will ensure easy access of data and quicker disposal of land disputes. Plot wise of this digitalisation with clear and accurate records will provide an efficient and transparent result for ownership authentication or inheritance including all previous transactions. The government also inaugurated the Second Generation Khotian Continuity Chain/Tree System. This *Khotian* tree has been added to the Porcha system with the aim of saving digital information of all surveys, adding history of all surveys in one *Khotian*, determining real ownership by settling cases in a short time. It has been predicted that human suffering will be decreased by connecting e-Mutation with national e-Registration, consequently, there will be decreased lawsuits and forgeries.

With the aim of enriching citizens with land information, the Ministry of Land has launched artificial intelligence, so called *land-pedia*. Citizens will be able to get all types of legal information and advice related to land from this single digital platform. The main objective of artificial intelligence i.e., *Bhumi*

[1] It is a map is used to maintain the record of land measurement.

[2] It is an accounting journal as a physical object, or a record in which commercial accounts are recorded.

Pedia (In English: Land pedia) is to establish a strong 'knowledge network' by bridging the knowledge gap between land service providers and land service aspirants. From this platform, citizens will get answers and suggestions for all questions related to land by typing the keyword voyage. It also has a chatbot facility with artificial intelligence. This system will gradually become a virtual advisor by constantly extracting knowledge from various media. *Bhumi Pedia* will have a blog and forum facility, one can find solutions from one another to solve land related problems.

In future the *Bhoomiseba* policy will be governed by 60-30-10 principle i.e., 60% citizens of the land services by digital mode, 30% by professional agent and remaining 10% from land offices directly. The main goal of the government is to ensure that most of the land services are done at home, including bringing down border disputes, land robbery to zero through automation software for land management, i.e. no one needs to come to the land office.

3.3.2. Türkiye Case

Over the last two decades, Türkiye is improving the efficiency and accuracy of land registry and administration processes. As of April 20, 2024 in Türkiye, it has calculated that the total number of cadastral parcels is 58,245,747 and approximately 21.8 million individual units are available (DGLRC, 2024). Around 11,087,897 cadastral parcels were produced within 3 years (Ercan, 2020). Generally, the accuracy and consistency are very challenging in cadastral maps, including various errors in digitalisation and registry process (Meral and Ahsan, 2021). Outdated maps in many localities' do not correspond with the exact parcel areas or location is a serious issue. The GDLRC performed a two ways approach: Applying new technologies in areas where there were no cadastral works and renewing problematic or graphic or outdated cadastral parcels. Since 2005, land registry activities have been carried out in the computer environment through the Land Registry and Cadastre Information System (*Tapu ve Kadastro Bilgi Sistemi*-TAKBİS). The primary and auxiliary registers that constitute the land register are managed through this TAKBIS system. It is one of the most significant and fundamental e-government initiatives that aims to ensure inquiry based on spatial data maps and transfer various property information to computers nationwide (GDLRC, 2024). It analyses within the logic of GIS and LIS to determine problems and find solutions including Land registry and cadastre modernization project (TKMP) (GDLRC, 2024). The GDLRC has built Continuously Operating Reference Stations (CORS-TR), completed rural area cadastre throughout the country, renewed rural cadastre for about 14 million of 23 million parcels (Ercan, 2023), started 3D map production projects, and cooperated with the General Directorate of Forestry for establishing forest cadastre and supported the establishment of forest cadre. The Cadastral data were digitised and presented to the use of citizens and companies through the Spatial Property System (Mekânsal Gayrimenkul Sistemi - MEGSİS) using the parcel query mobile application for informative purposes without taking legal responsibility. The GDRLC has become a data provider in terms of providing registry and cadastral data. Figure 1 shows the Integrated Information System of cadastral system in Türkiye. It is calculated that if the GDLR continued to make cadastre using traditional methods; it would need around 31.5 years to release the entire country cadastre instead of 3 years (Ercan, 2020).

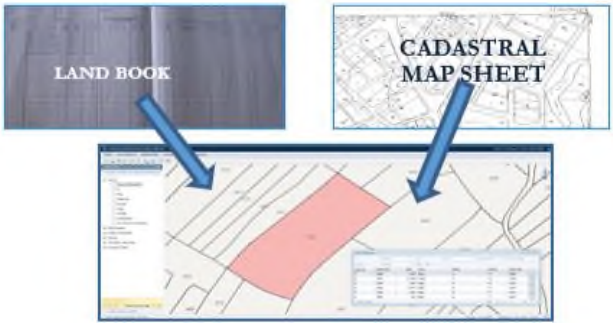

Figure 1. Integrated Land Information System of Türkiye

The cadastral data were digitised and presented to the parcel query mobile application for informative purposes without taking legal responsibility. The GDLRC has become a data provider in terms of providing registry and cadastral data. The GDLRC have transformed to an electronic system and deliver the following electronic transactions: E- taxes, duties and charges (*E-Tahsilat*), E-Appointment (*E-Randevu*), E- announcement (*E-İlan*), Digital Archive (*E-Arşiv*), E- Seizer (*E-Haciz*), E-Cancellation (*E-Terkin*), E-mortgage (*E-ipotek*), WEB land registry (*Web Tapu*), Application Query (*Başvuru Sorgu*), Parcel Query (*Parsel Sorgu*), Clearing room (*Tapu Takas*), Digital Land Registry Archive System (T*apu Arşiv Bilgi Sistemi*-TARBİS), Land Registry and Cadastre Information System (*Tapu ve Kadastro Bilgi Sistemi*-TAKBİS), Spatial Property System (*Mekânsal Gayrimenkul Sistemi*-MEGSİS). The 3D city models and cadastre projects were planned in 2019 to lasted three years aiming to create 3D models of individual units (apartments) in buildings and provide visual representations of these individual units with legal information. Turkish National Permanent GNSS Network- Active (*Türkiye Ulusal Sabit GPS Ağı – Aktif* or *TUSAGA-Aktif*), started to establish in 2006 and fully operational since 2009. It has 158 stations entire country and provides cm-level accuracy position information in real time with Real-time kinematic positioning (RTK) GPS (Global Positioning System) network, its datum transformation between ED50-ITRFxx, it has no GCP needed for surveying and cadastral works. In Türkiye, it saves around $50 million USD annually, which translates to a 30% reduction in all surveying and GIS projects (Ercan, 2019; Olmez, 2009).

Through these electronic systems the data offered by GDLRC in the first half of 2017 can be analysed with statistic given below;

i. 65,540,247 WMS inquiries in average per month,
ii. 4,336,810 WFS inquiries in average per month,
iii. 4,006,553 inquiries in average per month over e-government,
iv. 30,858,447 inquiries on average per month over the parcel inquiry application by national and international users. (Ercan, 2020)

There are over 21.8 million registered individual units, and in 2019, municipalities received 100,000 OP applications annually for new buildings (GDLRC, 2020).

3.3.3. Comparison between two countries

In the past, land management experiences included broker violence, document forgeries, and traditional analog service methods in the land offices of Bangladesh. Despite ongoing digitization efforts, there are still a lot of gaps in governance and loopholes in countries' various land administration sectors (Akter, 2022; TIB, 2015). Additionally, all of these tasks and sectors face many administrative and governmental obstacles. However, Türkiye's ongoing digitization efforts reduces gaps in governance challenges and loopholes in the country (World Bank, 2020).

Türkiye has also experienced lack of governance due to its traditional analog service methods in the past (Hülya & Ahsan, 2021). The land-man ratio, farmland etc. are decreasing, and therefore the government's movement to fully digitise the system will ensure opportunities for development of the country. The Government of Bangladesh also started the digitalisation process around a decade before, but the government started employing digital technology in various aspects of land services such as online *Khotian* collection, inheritance calculators and online databases just a few years before. To counter this, Türkiye already has reached a certain level of digitalisation by maintaining institutional framework and resource mobilisation properly. Reviewing both countries, it has found that both countries have taken numbers of digitalised or web-based actions where the Turkish government's effort is much more comprehensive by following a number of digitalised applications. The following table 5 shows the digitalisation activities in both countries.

Table 5. Digitalisation activities on land management in Bangladesh and Türkiye

Türkiye	Bangladesh
E-state	Land service *(Bhumi seba),* Mobile app
E- taxes, duties and charges	Online Land development tax
E-Appointment	E-Appointment
E- Announcement	-
E- Seizer	-
E-Cancellation	-
E-mortgage	-
WEB land registry	*Bhoomi seba*
Application Query	
Parcel Query	E-*Khotian* (*porcha*)
Clearing room	-
Digital Land Registry Archive System	E-mutation (naming), Digital Record Room Online Hearing
Land Registry and Cadastre Information System	E-mutation (naming), Digital Record Room
Spatial Property System	-
The 3D city models and cadastre projects	-
Turkish National Permanent GNSS Network- Active	-
Service can be received by SMS/hotline service	Service can be received by SMS/e-mail/hotline

Türkiye is making successive progress on land registry and cadastre systems over the recent years. Türkiye now consider one of the best practises land management and administrative countries (World Bank, 2020). It is making significant contribution on digitised land administration system at international level, including integrating its national standards with international standards. For instance, its National Geographic Information System, so called TUCBS, an e-government project where geographic data themes are compatible with International Organization for Standardization Open Geospatial Consortium (OGC) and Infrastructure for Spatial Information in the European Community (INSPIRE) (Gürsoy Sürmeneli and Alkan, 2021). It has been standardised to implement the semantic interoperability of national geographic data effectively.

The following Table 5 shows the state of land administration performance in Türkiye, Bangladesh and OECD countries covering different indicators highlighted by doing business report of World Bank.

Table 5. Land administration performance in Türkiye and Bangladesh

Indicator	Türkiye	Europe & Central Asia	OECD High Income	Best Regulatory Performance	Bangladesh (World Bank 2019)
Procedures (number)	6	5.5	4.7	1(5 Economies)	Not Available (-)
Time (days)	4.5	20.8	23.6	1(2 Economies)	270.8
Cost (% of property value)	3.0	2.7	4.2	0.0(Saudi Arabia)	7.2
Quality of land administration index (0-30)	27.0	20.4	23.2	None in 2018/19	6.5
Reliability of infrastructure index(0-8)	8.0	-	-	-	-
Transparency of information index (0–6)	4.0	-	-	-	-
Geographic coverage index (0–8)	8.0	-	-	-	-
Land dispute resolution index (0–8)	7.0	-	-	-	-
Equal access to property rights index (-2–0)	0.0	-	-	-	-

Note: The rankings for all economies are benchmarked to May 2019. The World Bank discontinued publishing the Doing Business report from 2021.
Source: World Bank, 2020, World Bank, 2019

According to World Bank's Doing Business 2020 Report, the Quality of land administration index[3] (0-30) ranked 27, scoring 81.6 (World Bank 2020), represents that Türkiye is following effective approaches

[3] The quality of the land administration index is measured by considering the reliability of infrastructure, transparency of information, geographic coverage, land dispute resolution, and equal access to property rights (World Bank, 2020).

in registering property. Reliability of infrastructure index (0-8), Türkiye scored 8.0; Transparency of information index (0–6) scored 4.0; Geographic coverage index (0–8) scored 8.0; Land dispute resolution index (0–8) scored 7.0; Even by comparison with OECD countries Türkiye stood 4th in sharing property data following United States, Sweden and Denmark. Türkiye reduced the cost of property registration temporarily by lowering the mortar charges associated with property transfers, and also expedited the process by shortening the time required to receive a tax assessment. However, as per World Bank's Doing Business 2019 Report, the Quality of land administration index (0-30), Bangladesh scored only 6.5. again, in terms of score for registering property (0–100) Bangladesh scored only 28.91 and ranked 183 which is very low. Though Bangladesh government has introduced Grievance Redress System (GRS) system aiming to address the challenges of corruption, lack of accountability, and poor service delivery. The government wants to make hassle free services and expected to make the Automated Land Administration and Management System (ALAMS) Program 2022-2026 functional by 2026 though the project was originally scheduled to complete by 2025. With the goal of increasing land ownership transparency, the government initiated around 102 million USD project introduced the Digital Land Surveying System (DLSS). Unfortunately, the projects' current progress is unsatisfactory; three and a half years after 2020, the project's progress is still only 0.28%, which has led the authorities to consider abandoning it midway through (dhakatribune.com). The dismal performance raises concerns about weaknesses in planning of the project, which was undertaken without a feasibility study. Again, a severe shortage of human resources in the Department of Land Record and Survey is one of the major causes behind these (dhakatribune.com). In addition, the Planning Commission officials also stated that under the project, the target was to install 260,369 geodetic control pillars in 470 upazilas across 61 districts whereas Türkiye is following Turkish National Permanent GNSS Network- Active which provides cm-level accuracy position information in real time with RTK GPS network.

4. CONCLUSION AND RECOMMENDATIONS

The world has been changing at a speedy rate, and technology has been leading the digital transformation. Digitalization now has already deeply affected all aspects of social, economic and business life, and new spatial technologies have been becoming a part and parcel in our daily lives. The land administration practices in Bangladesh and Türkiye exhibit significant differences, influenced by the integration of digital technologies. Türkiye has made strides in adopting modern digital solutions that enhance efficiency and transparency in land administration. However, Bangladesh struggles with an outdated and inefficient land management system, with many loopholes and managerial deficits in different sectors of land governance.

As more than 70% of the SDG's targets are related to geospatial technologies and land administration, thus, it is not possible to achieve land related SDG goals unless issues related to land ownership, use, value and development are resolved on the common ground of a Spatial Data Infrastructure (SDI) and its proper planning and management. Bangladesh is now achieving progress in land and cadastre systems whereas Türkiye is making progressive success on digitalised land registry and cadastre systems without delaying any steps of digitalisation or automation system. The following recommendations have been proposed in this study:

i. Centralised management

The land administration system in Bangladesh still mostly paper-based though government planned to govern by 60-30-10 principle i.e., 60% citizens of *Bhoomiseva* will be able to receive services by themselves through digital mode. For 30% of land service, citizens will take the help of a professional agent by paying a fixed fee. And in case of 10% land service only citizens will go to land office (Sultana, 2023). But in practice, it seems challenging due to lack of infrastructure and decentralised management. Again, land records are kept in different offices, which create duplication and a lack of coherence. On the other hand, GDLRC in Türkiye under the Ministry of Public Works and Settlement is the central organisation plays a comprehensive role in land management, registry, cadastre and survey. The Bangladesh government could manage its land management, record and services activities through a

single organisation like GDLRC to remove loopholes and governance problems and make a better economic contribution for the country. These centralised land management could provide a strong structure within an organisation. It can develop a uniform information-sharing procedure, can increase efficiency, reduce costs, and make property management easier than ever.

ii. From paperwork to robust digitalisation movement

The digital transformation of land, i.e., integration of spatial data, data analytics, and real-time operations all are highly needed for the advancement of a country. Its data-driven approach also increase administrative performance in different aspects related to transactions, customer interactions, maintenance and so on. Türkiye started its TAKBIS project in 2002 but it could finish in 2012, exhibits a decade required for the project The progress of Bangladesh is not satisfactory so it needs to expedite land registry and cadastre to complete the digitalisation process otherwise it may take decades of time. Again, every land office or cadastre office must ensure efficient digital infrastructure with utilisation of ICT tools properly.

iii. User friendly one stop service

Integrated management is required for the quick and user friendly one stop service. It will enhance service delivery quickly, improve transparency and good governance. Though the Bangladesh government has launched a hotline service (call no.16122) but it requires an active and proper implementation. Bangladesh Government has prepared Citizen Charter for every ministry and its departments/directorates to ensure an efficient, effective and high-quality service which is fruitful for Türkiye also. However, there needs to be an effective Monitoring and Evaluation system.

iv. Planned judiciary and management system

The management of land, digitalisation is very challenging as it requires robust land governance and modern technology-based practices to solve the problems. The Bangladesh government has adopted an act on land crime prevention and redress but there needs proper implementation. Türkiye is also tackling governance challenges though the e-government system is providing benefits to the citizens, but it also requires a robust governance system.

v. Capacity building project

It has been identified that the digital land administration system is not performing well in Bangladesh due to lack of skilled human capital. Therefore, the government should ensure qualified personnel by recruiting or by increasing qualification of the existing personnel by providing adequate training programs. In this respect, the government should organise capacity building programs/projects to the existing personnel. Though *Bhumi Seba* digitization activities are taking place, still many practices are needed.

vi. Alternative projects

Serious or immediate attention can be taken to the need for alternative strategies which will promote efficiency in land management. For instance, the government is targeting to install 260,369 geodetic control pillars in 470 upazilas across the country. But in Türkiye, Turkish National Permanent GNSS Network-Active has reduced time and money that could be an alternative project for Bangladesh.

Both countries need new disruptive based technology-based projects on Artificial Intelligence, Blockchain, Internet of Things, Big Data, Cloud Computing, Visual Reality and Augmented Reality in order to ensure more effective services in land administration, management and planning for the future.

Finally, it can be stated that the land surveying and cadastre, land record with best-practised countries' experience like Türkiye is beneficial for the improvement of land administration like Bangladesh.

Again, it can be stated here that this study has proposed some future research:

- One of the key components of the Turkish success story of land administration is private sector involvement. Considering the extent of the study, private sector issues have not focused on this study which could be performed in further research.
- Further research could answer the efficiency and effectiveness of land registry and cadastre services and digitalisation performance in both countries.
- As both countries have a long history of land laws and policies from ancient periods therefore

analysing past experience could provide a glimpse of land management and administration practices.

Declaration of Ethical Standards

Author declares that this study is completely original by adhering to all ethical rules including authorship, citation, and data reporting.

Declaration of Competing Interest

Author declares that there is no conflict of interest.

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