

**Final Report**

**Improving Land Administration and Management  
in Bangladesh**

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## Abbreviations and Acronyms

A2I	Access to Information
AC	Assistant Commissioner
ADB	Asian Development Bank
AG	Adarsha Gram
BBS	Bangladesh Bureau of Statistics
BEPZA	Bangladesh Export Processing Zone Authority
BEZA	Bangladesh Economic Zone Authority
BIDS	Bangladesh Institute of Development Studies
BS	Bangladesh Survey
BSCIC	Bangladesh Small & Cottage Industries Corporation
CARE	
CEGIS	Center for Environmental & Geographic Information Services
CLO	Certificate of Land Ownership
CS	Cadastral Survey
CSO	Civil Society Organization
DAE	Department of Agricultural Extension
DC	District Commissioner
DLR	Department of Land Registration
DLRS	Directorate of Land Records & Surveys
EPA	Environment Impact Assessment
EPZ	Export Processing Zone
e-Service	Electronic Service
EZ	Economic Zone
FAO	Food & Agriculture Organization
FDI	Foreign Direct Investment
GIS	Geographical Information System
GoB	Government of Bangladesh
GPS	Global Positioning System
ha	Hectares
ICT	Information & Communications Technology
IPTT	Immovable Property Transfer Tax
IT	Information Technology
LDT	Land Development Tax

LIS	Land Information System
LRB	Land Reform Board
LT	Land Transfer
MLJPA	Ministry of Law, Justice & Parliamentary Affairs
MoL	Ministry of Land
NGO	Non-Government Organization
NLUP	National Land Use Policy
PMO	Prime Minister's Office
PPP	Public-Private Partnership
ROR	Record of Rights
RS	Revisionary Settlement Survey
SA	State Acquisition Survey
SEZs	Special Economic Zones
SFYP	Seventh Five Year Plan
SLM	Sustainable Land Management
SoEs	State Owned Enterprises
SRDI	Resource Development Institute
UN	United Nations
UNDP	United Nations Development Programme
UP	Union Parishad

## Executive Summary

Land availability as well as its sustainable management has important bearings on overall development in general, and food security, business development and human habitation in particular. Land scarcity relative to demand is showing up in accelerating increases in land prices, especially in urban areas including Dhaka. The development of an organized and efficient land market is a key requirement for achieving the development goals of Bangladesh. The small area and rapid increase of population characterize Bangladesh with the lowest land-man ratio in the world, which is estimated to be 0.06 hectares (ha) per person (FAO, 2013). The situation is likely to deteriorate further with a growing demand for non-agricultural land. As a consequence, the rate of land transfer and land conversion is also very high in Bangladesh. The agricultural land, which is now about 84 percent of total land, has been depleting at a rate of almost 1 percent per annum. A substantial area of farmland is being eaten up every year by new homes, roads, educational institutions, industries, etc. The issues of conversion along with land degradation due to climate change effect give rise to necessity of proper land management for planned use of scarce land, and an efficient land administration is deemed to be instrumental to this end.

The impact of scarcity of land is being felt in different areas of investment, both local and foreign, in new industrial and commercial ventures. Business communities often complain that foreign investors are not coming to Bangladesh mainly because of land scarcity. While the domestic investors can manage land for their ventures but the cost of the same tends to make their projects economically not viable. The foreign investors, however, is entirely dependent on government cooperation to select suitable land for their ventures. But the government faces various difficulties in allocating suitable land to foreign investors due to scarcity of land in suitable places as well as complexities in the land acquisition policies. Thus, land scarcity and lack of proper policies continue to dampen the investors' enthusiasm.

Given the fact that the land administration system in Bangladesh is still conventional and characterized by inefficiencies and corruption, such conventional land administration system cannot keep pace with the growing demand and changing situation of the land market. Inadequate and improper land records increase difficulties in securing land tenure and land transfer. Thus, an inappropriate land administration and management system is the root cause for unplanned growth, and this eventually generates problems in development of the country. For this, it becomes an important agenda in the Seventh Five Year Plan document to establish a sustainable land administration and management system.

The current administrative structure of land management in Bangladesh is built around three core functions: (i) record keeping, (ii) registration, and (iii) settlement. The core functions of land administration are maintained by various departments of two Ministries, The Ministry of Land (MoL) and the Ministry of Law, Justice and Parliamentary Affairs (MLJP). While the MoL discharges most of the land-related activities including survey, collection of land development tax, arbitration process, the MLJP mainly records land mutation and transfers.

The diversity of ways by which land records is updated and the problems associated with each, give rise to numerous disputes in which the rich and powerful inevitably enjoy the upper hand.

At present the responsible ministries and agencies involved for land management and administration work independently with little coordination among them. The whole process is manual, laborious and time intensive. Conventional methods of land survey, preparation and upgradation of land records, maintenance of all related data for each parcel of land makes land administration and management inadequate and inefficient. Moreover, distortion of land records at various stages (i.e. plot-to-plot survey, preparation of records and drawing of maps through conventional methods, objections, junk/checking works, printing, etc.) hinder land development control and property tax collection. The current system of land administration and management appears to be inadequate and inefficient.

### **Improvement of Land Administration and Management System**

For efficient and appropriate land management system, maintenance of updated land ROR is very important. To address the inefficiencies involved, it is important to integrate all ownership information and allow all related agencies to share the same up-to-date information. To improve the land administration and management system, there are various solutions as suggested by stakeholders. While some of the solutions appear to be long-term by nature, some are short-term. It is not possible to change the current administrative structure overnight to solve all the problems considering various difficulties involved with it. Rather, an IT solution can be sought to integrate the system and allow easy and quick fix of problems.

- 1. Integrate Land Records Management through DLRS:** To provide up-to-date *khatian* records, it is necessary to compile data scattered throughout different agencies in one place and prevent generation of overlapping data from different locations. Through a digitized integrated system, land records collected from government agencies, external administrative units and local autonomous bodies will go directly into the integrated database and will enable to provide a variety of services including the real estate registration system, portal systems for people, kiosks, and mobile services. The focal institution for integrated land management should be the Department of Land Records and Surveys (DLRS). Through these services, related agencies such as the AC (Land) Office, the Settlement Office and Sub-Registrar can update their databases by linking with the newly generated data in real time and thereby handle all land-related tasks including taxes, documentation and statistical information as well as *khatian*. In this regard, some pilot projects are now underway, which needs to be completed in due time. It is expected that digitized integrated land management system would be completed during the Seventh Five Year Plan period.
- 2. Development of Land Information System:** A well-developed land information system (LIS) is important to facilitate quick capturing, retrieval and querying of different cartographic information. Land administration and management, land use control, provision of utility services and other services can be pursued by computerized LIS. This system would serve unified services related to land management by marginal labor, time and money. Use of LIS for recording and maintaining the original volume of land records could minimize the chances of tampering of records. This will help arrive at compatible multiple land uses within selected parcel of land. However, development of an integrated LIS is not an easy task and it will require a fairly longer time, say 5-10 years. This can be started during the seventh five year plan.
- 3. Develop Alternative Dispute Resolution (ADR) Mechanism at the local level:** In the context of its limited number of judges, inadequate judge-population ratio, insufficient

budget allocation for the judiciary and lack of infrastructure in the legal system, the reliance on ADR becomes just a demand of the time. Given that many developed and developing countries have gained tremendous success in reducing pending cases by adopting ADR, Bangladesh should find and try ways and means to develop ADR modes in the same fashion. In case of any disputes arising during land survey and recording, it can be resolved with the help of NGO, CSO and local government bodies such as Union Parishad (UP) representatives. If the disputes are related to boundary and simple in nature, it can be resolved through village court at the UP. This type of land dispute resolution mechanism needs to be developed, which will help reduce volume of land related court cases. A high level committee can be formed to provide recommendations on effective alternative dispute resolution mechanisms for land related disputes.

#### **4. Overall improvement of land governance**

Land governance encompasses statutory, customary and religious institutions as well as covers both the legal and policy framework for land as well as traditional and informal practices that enjoy social legitimacy. Weak land governance leads to many tenure-related problems in Bangladesh. Improving land tenure arrangements often means improving land governance. An understanding of land issues from a governance and political economy perspective can be derived through:(i) legal and institutional framework related to tenure and markets; (ii) land use planning, management and taxation; (iii) management of public land; (iv) public provision of private land, and (v) dispute resolution and conflict management. Therefore, it is necessary to take proper actions on the following issues during Seventh Five Year Plan period:

- Revision of National Land Use Policy harmonizing other cross-sectoral policies
- Digitization of land record system and gradual development of Land Information System
- Land zoning and creating special economic zones
- Preparation of *khash* land inventory
- Alternative dispute resolution mechanism involving NGOs, CSOs etc.



# Chapter 1

## Background

### 1.1 Introduction

An efficient system of land administration and management is imperative for overall development of Bangladesh given its scarce land resource and rapid population growth. The total area of Bangladesh is 1,44,570 sq km with population over 150 million, which makes Bangladesh a densely populated country with over 1000 people living per square kilometer. The small area and rapid increase of population characterize the country with the lowest land-man ratio in the world, which is estimated to be 0.06 hectares (ha) per person (FAO, 2013). The situation is likely to deteriorate further with a growing demand for non-agricultural land. As a consequence, the rate of land transfer and land conversion is also very high in Bangladesh. The agricultural land, which is now about 84 percent of total land, has been depleting at a rate of almost 1 percent per annum. A substantial area of farmland is being eaten up every year by new homes, roads, educational institutions, industries, etc. The issues of conversion along with land degradation due to climate change effect give rise to necessity of proper land management for planned use of scarce land, and an efficient land administration is deemed to be instrumental to this end.

Land availability as well as its sustainable management has important bearings on overall development in general, and food security, business development and human habitation in particular. Land scarcity relative to demand is showing up in accelerating increases in land prices, especially in urban areas including Dhaka. The development of an organized and efficient land market is a key requirement for achieving the development goals of Bangladesh. The government has formulated the National Land Use Policy in 2001 with a view to improve land administration and management, and provide guidelines to land use and zoning. While the basic thrust of the policy in regard to land use has been well endorsed, the policy lacks proper action plan for which it has not been proved to be an effective land use policy. Moreover, other cross-sectoral policies have not been harmonized in the National Land Use Policy, 2001, which also creates problems for successful implementation of the policies.

The impact of scarcity of land is being felt in different areas of investment, both local and foreign, in new industrial and commercial ventures. Business communities often complain that foreign investors are not coming to Bangladesh mainly because of land scarcity. While the domestic investors can manage land for their ventures but the cost of the same tends to make their projects economically not viable. The foreign investors, however, is entirely dependent on government cooperation to select suitable land for their ventures. But the government faces various difficulties in allocating suitable land to foreign investors due to scarcity of land in suitable places as well as complexities in the land acquisition policies. Thus, land scarcity and lack of proper policies continue to dampen the investors' enthusiasm. For any industrial or commercial venture, location is an important factor. In response to the problem, the government has enacted National Economic Zone Act, 2010 to facilitate investments in selected areas; however, much depends on proper implementation of the Act. Bangladesh Economic Zone Authority (BEZA) has recently finalized some 11 sites across the country for establishing economic zones, of which about five zones are expected to operate from 2015. The pace of

operationalizing Special Economic Zones (SEZs) is, however, not satisfactory. In setting up SEZs, Bangladesh lags far behind of its comparators. Vietnam has so far built more than 400 economic zones since 1990s, while China, Malaysia and Indonesia have hundreds of such zones for their investors, both local and foreign. Myanmar is also making fast progress to catch the waves of global investors. Bangladesh needs to keep pace with her comparators in setting up SEZs in order to attract more foreign private investments in the context of changing investment scenario in Asia, particularly in China.

Given the fact that the land administration system in Bangladesh is still conventional and characterized by inefficiencies and corruption, such conventional land administration system cannot keep pace with the growing demand and changing situation of the land market. Inadequate and improper land records increase difficulties in securing land tenure and land transfer. Thus, an inappropriate land administration and management system is the root cause for unplanned growth, and this eventually generates problems in development of the country. For this, it becomes an important agenda in the Seventh Five Year Plan document to establish a sustainable land administration and management system.

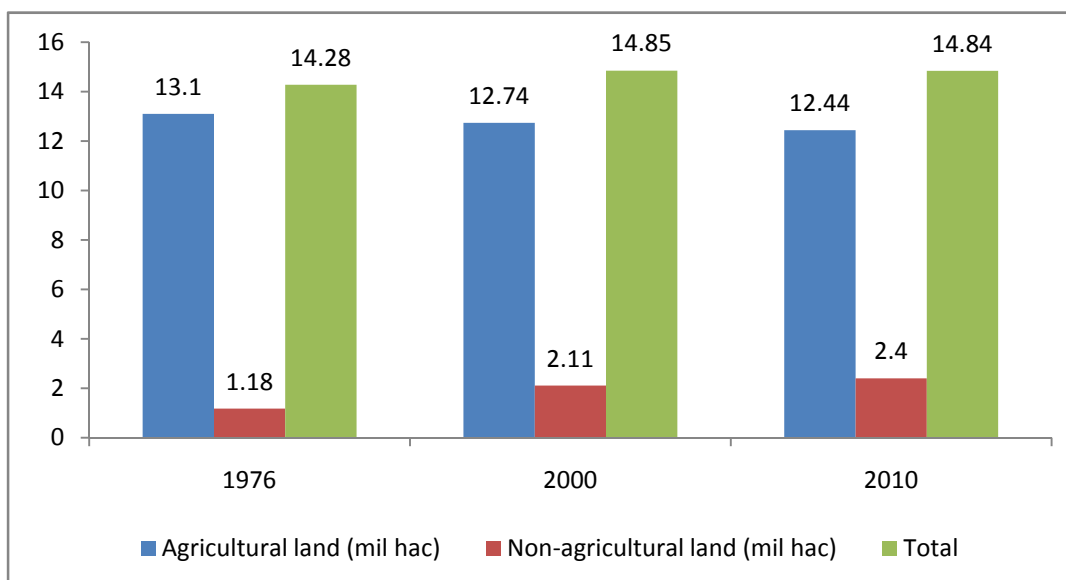
The objectives of the study are to:

- review the existing land management system and explain how land has become a binding constraint to the development of business and human habitation ;
- provide indicators of increasing land scarcity in both urban and rural areas;
- explain the key land use regulations regarding land transactions, zoning, and use;
- assess the key land administration institutions and their effectiveness;
- suggest a sustainable land administration systems that secure land tenure and property rights with a mechanism for systematic registration and regularization including the establishment of digital registration and recording systems;
- review national strategy for ICT and software development for the land sector of Bangladesh and suggest setting up of document management and the formulation of digital archive strategies for efficient land administration, and
- identify key legal, regulatory, financial (taxes and fees) and institutional reforms that will be needed to implement the above strategies leading to an organized and efficient land market.

## **1.2 An Overview of Land Area in Bangladesh**

The total area of Bangladesh is 145,778 sq. km in 2010, which was estimated at 144,873 sq. km and 145,306 sq. km. in 1976 and 2000 respectively. Overall land gain was 905 km (90,512ha) during 1976 to 2010 mainly due to accretion in the southern coastal zone of Bangladesh (Hasan et al., 2013). Agricultural land area has decreased from 13.1 million *ha* in 1976 to 12.44 mil hectare in 2010—the total loss of agricultural land is 0.66 mil *ha* (Figure 1.1). The conversion of land from agriculture to non-agriculture is an important issue while dealing with land administration and management. *Khas* land management and distribution is another concern due to lack of official records and consequent loss of substantial amount of *khas* land.

**Figure 1.1: Types of land in Bangladesh, 1976-2010**



**Source:** Hasan et al. (2013).

The estimated conversion rate of agricultural land to non-agricultural land differs across studies. While UNDP (2003) reported an annual conversion rate of about 1 percent, it was reported to be 0.13 percent by Rahman and Hasan, (2003) and 0.27 percent by BBS (2011) for the period 1976-2010<sup>1</sup>. Rahman (2010) estimated that the overall land area was increased by 4 percent during 1948-2006 due to land accretion in coastal areas, i.e. reclamation of char lands, whereas 0.1 percent cultivable land was annually transformed to housing, road and industrial infrastructures in the same period. In a similar study, CEGIS (2008) reported that 156,780ha land were lost due to erosion along the Jamuna, Ganges and Padma rivers, and at the same time 45,520ha areas were accreted during 1973-2008<sup>2</sup>.

The declining trend of agricultural land varies across periods and exacerbates in the 1990s. The agricultural land was declined by about 0.26 percent annually from 1976 to 2011 (34 years average), 0.42 percent annually from 1976 to 2001 (25 years average), 0.75 percent annually from 1983 to 1994 (10 years average) and 0.40 percent annually from 1994 to 2004 (10 years average). However, there was a slight increase of agricultural land during 2001-2011 (average 0.15%) (Table 1.1); however, the increase was due to reclamation of char lands. On the other hand, the cultivable land has declined by 0.10 percent annually, mainly due to transfer to housing, road and industrial infrastructures.

<sup>1</sup> Despite the differences in the estimated conversion rate of agricultural land to non-agricultural use, this conversion is alarming in respect to the total crop production and food security in Bangladesh. However, the rate of 1% conversion does not appear to be correct because in this case at least one quarter of the country's agricultural land would have been lost since independence. Notwithstanding the discrepancies in the estimation of land shifting rate, it is more likely that the conversion rate may be much faster in the coming years because of faster economic growth and infrastructure development.

<sup>2</sup> The difference between SRDI and DAE reports in the availability of agricultural land is about 0.4 million hectares, which may be due to data collection techniques applied by the institutions.

Another study by CEGIS (2008) estimated that the amount of total land eroded was 156,780ha and accreted 45,520ha along the rivers of Jamuna, Ganges and Padma during 1973 to 2008 (CEGIS, 2008). A proper zoning map and inventory of such land would be important for sustainable land management.

**Table 1.1: Availability of agricultural land during 1976 to 2011**

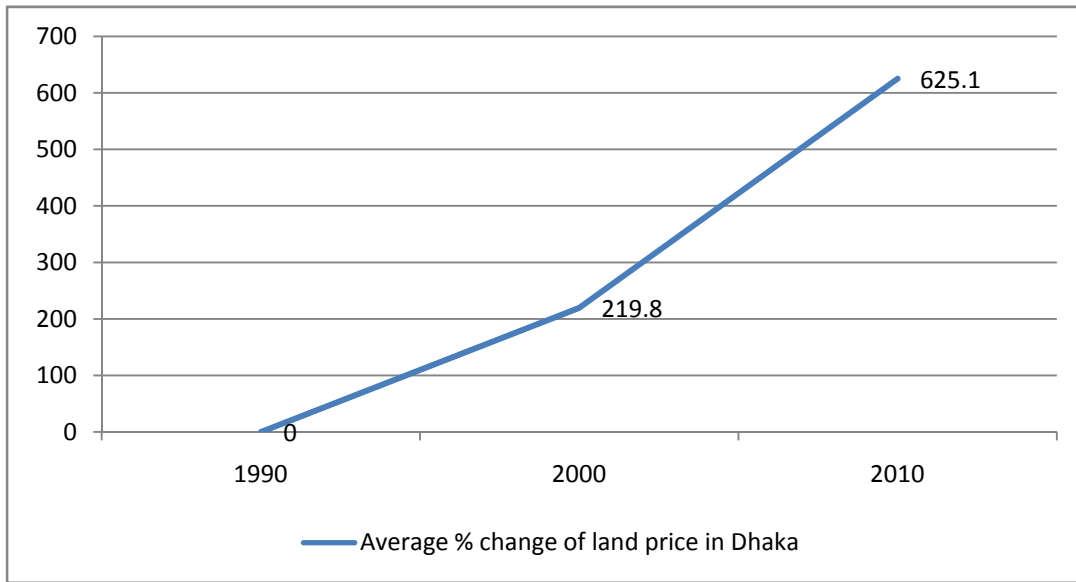
Year	Land Area of Bangladesh (million ha)	Cultivable Land (million ha)	% Cultivable Land
1976-77	14.28	9.39	65.75
1980-81	14.29	9.38	65.64
1985-86	14.48	9.44	65.19
1990-91	14.84	9.72	65.50
1995-96	14.84	8.72	58.76
2000-01	14.85	8.40	56.57
2005-06	14.84	8.42	56.74
2010-11	14.84	8.52	57.41

*Note: Agricultural land is the summation of cropped land, current fallow and culturable waste.*

**Source:** BBS, 2011

The increasingly high rates of urbanization have generated pressure on land use for housing developments and all other services that are required to sustain an urban population. This exerts a tremendous pressure on agricultural land for the use of non-agricultural activities including housing and business. While the area of non-agricultural land was 1.18 mil *ha* in 1976, it has been increased to 2.4 mil *ha* in 2010. This trend is linked to the diversification of the economy and the consequent effect is the astronomical increase in land prices with the connected speculator practices that normally accompany high growth periods in land markets (a 600% price hike during 1990-2010, Figure 2). As a result, the cost of operating a business in Dhaka and other urban areas goes beyond affordability of private entrepreneurs. It also affects the possibility of the state to acquire areas for development projects as the cost of acquiring such lands is getting out of control.

**Figure 1.2: Change (%) of land price in Dhaka, 1990-2010**



Source: REHAB and BBS.

### 1.3 Khas Land

There has been a significant amount of *khas* land in Bangladesh with direct or indirect ownership of the government. An old estimate of *khas* land suggests that there are 3.3 million acres of *khas* land available, of which 0.8 million acres are of agricultural *khas* land, 1.7 million acres are of nonagricultural *khas* land, and 0.8 million acres are of *khas* water-bodies (Bartakat et al., 2000). However, the actual area of *khas* land would be higher than 3.3 million acres, as suggested by various stakeholders. The reasons are attributable to the problems in official land record system, and dispute between government and ‘so called’ owner. The amount of *khas* land and water bodies available in the country varies by divisions ranging between 46.3 percent in Chittagong and only 4.5 percent in Khulna. In terms of availability of agricultural *khas* land, Dhaka division has the highest share (26%) and Khulna, the least (6.4). The highest share of non-agricultural *khas* land belongs to Rangamati (32% of the country total) and the lowest with 0.01 percent to at least 12 districts (with nil for two districts). A serious mismatch is evident in the official statistics of open water bodies (Barakat et al., 2000).

In *khas* land management and distribution, the main problem is that there is no accurate inventory of *khas* land available with the government. Many *khas* plots were grabbed by local elites and powerful quarters who have strong political nexus. Regarding distribution of *khas* land, the official records (unpublished) provide status on agricultural *khas* land only, which constitutes one-fourth of the total identified *khas* land. According to official source, about 44 percent of the 0.8 million acres of (identified) agricultural *khas* land has already been distributed amongst the poor, landless and destitute. The rest are illegally occupied by rich and powerful people in the society. Barakat et al. (2000) study suggests that of the amount of *khas* land distributed so far, about 56 percent could not be retained by the poor people as it was engulfed by the local influential. As a result of combined effect of the above two estimates, it can be concluded that only 11.5 percent of the agricultural *khas* land has been effectively distributed to the landless and poor, and the rest 88.5 percent is illegally occupied by the rich and powerful. It

is therefore important to modernize the land administration and management which will also take into account of *khas* land properly.

#### **1.4 Organization of the Report**

The Report is organized as follows. Chapter 2 discusses regulations on land use, transfers, acquisition and settlement and Chapter 3 discusses various aspects of land administration and management in Bangladesh. Chapter 4 highlights land zoning and sustainable land management issues and chapter 6 provides conclusions and recommendations.

## **Chapter 2**

### **Regulations on Land Use, Transfers, Acquisitions and Resettlement**

Bangladesh Government has formulated various policies in regard to land use, transfers, acquisition and resettlements. Some of the key policies and Acts are discussed below.

#### **2.1 National Land Use Policy, 2001**

The National Land Use Policy, 2001 (NLUP) has been an important policy documents till now in regard to land use in Bangladesh. The main objectives of formulating the ‘National Land Use Policy, 2001’ is to ensure criteria based uses of land and to provide guidelines for usage of land for the purpose of agriculture (Crop production, fish cultivation and rearing of ducks and chickens), housing, afforestation, commercial and industrial establishments, rail and highway and for tea and rubber gardens. This policy mainly identifies limitation of land use and management of limited land resources of the country.

The key objectives of the Policy are to:

1. reform the present land administration system by introducing Certificate of land Ownership (CLO) which records all lands of each household in a single document;
2. update different laws related to proposed land administration reform;
3. prevent alarming loss of agricultural land, which is needed to increase production to meet the food demand of the population;
4. protect state-owned land which can be used to meet the needs of development projects;
5. prevent soil degradation;
6. zoning of land for commercial and other purposes;
7. prevent wasteful use of acquired land;
8. increase crop intensity through optimal use of available agricultural land;
9. establish a data bank for *khas* land, fallow land, acquired land, char land etc. for ensuring proper use.

While the above detailed objectives appear to promote a sustainable and planned utilization of land, the Policy lacks a plan of action. Though a draft National Zoning Act and Village Improvement Act were prepared in 2010 in line with the Land Use Policy, they were not yet officially adopted. While the preparation of a nation-wide Land Zoning Map is ongoing under a project implemented by the Ministry of Land, its progress is very slow. Mapping of about 100 Upazilas have been completed by this time and the rest is expected to be finished by 2015.

Considering landlessness, historical inequities, and widespread land grabbing, it would have been more useful if the land use Policy was to be conceived as a tool for striking a balance between efficient and equitable utilization of land resources. The existing policy falls short of

providing guidance as to how cross-sectoral interests and plans relating to land should be coordinated (Gebremedhin, 2014). Given the limitations of the existing NLUP, a revision of the national Land Policy is desirable during the Seventh Five Year Plan period by outlaying guiding principles on appropriate and sustainable use of specific type of land, sectoral and cross-sectoral land use and environmental management. The policy must take inputs from the ongoing land zoning maps, particularly the problems associated with multi-sectoral nature of land use, unabated frictions among different sectors due to competing uses and negative environmental effects on land. For a conclusive Certificate of Ownership, it is important to rationalize the existing institutional framework for recording or registration of property rights and avoid mandates that are either overlapping or difficult to coordinate.

### **Box-2.1: Land Related Policies and Acts**

- National Land Use Policy, 2001
- *Khas* Land Settlement Policy, 1997
- Non-agricultural *khas* Land Settlement Policy, 1995
- *Khas* Land Settlement Policy for Hotel Motel, 1998
- Balu Mohal and Sand Management Rules, 2011
- Chringri Mohal Management Policy, 1998
- Jal Mohal Management Policy, 2009
- Salt Mohal Management Policy, 1992
- Vested Property (Amendment) Law 2011
- The Acquisition and Requisition of Immovable Properties Ordinance, 1982
- The Land Development Tax Ordinance, 1976
- The Registration Act, 1908
- The Land Reform Board Act, 1989
- The Land Appeal Board Act, 1989
- The Transfer of Property Act, 1882
- The Stamp Act, 1899
- The State Acquisition and Tenancy Act, 1950

Other cross-sectoral policies, such as the National Agricultural Policy, National Rural Development Policy, National Forest Policies and Coastal Zone Policy need to be aligned and harmonized in order to prepare a comprehensive land policy.

## **2.2 *Khas* Land Management policies**

The major elements in the evolution of the laws on *khas* land can be traced in the following instruments: Bengal Regulation XI 1825, Bengal Alluvion Act 1868, Government Estates Manual 1919, Bengal Crown Estates Manual 1932, East Bengal Acquisition and Tenancy Act 1950, The Bangladesh State Acquisition and Tenancy (Fourth Amendment) Order 1972 (PO 135), Bangladesh Landholding Limitation Order 1972 (PO 98), President's Order LXI 1975, Land Reform Action Program 1987, Agriculture *Khas* Land Management and Settlement Policy 1997. In addition, many circulars and memos were issued by competent authorities, many of which are contradictory by nature. So far, agricultural *khas* land is concerned, the East Bengal State Acquisition and Tenancy Act 1950 was the mainframe legal document which was



promulgated to abolish the Zemindari System (Permanent Settlement of 1793). This law was the basis for all subsequent laws on *khas* land which declared that "So far as agricultural lands are concerned, they shall be held by one class of people to be known as maliks or raiyats which means that those shall be no intermediary between the State at the top and malik or raiyats to be regarded as the tillers of the soil at the bottom".

There are two *khas* land management policies: Agricultural *Khas* Land Management Policy and Non-agricultural *Khas* Land management Policy. The basic tenets of these policies are to provide institutional structure and procedures for locating *khas* land and distributing it particularly to landless. In addition, the policies set forth detail provisions on the composition and responsibilities of the committees that it establishes in relation to management of *Khas* land. Compared to non-agricultural *khas* land management policy, agricultural *khas* land management policy appears to be adequate in terms of its coverage of issues pertaining to *khas* land management (Gebremedhin, 2014). The non-agricultural *khas* land management policy was framed in order to address the issue of land grab by powerful elites and lease procedure of non-agricultural *khas* land. Considering the serious consequences of grabbing non-agricultural *khas* land, the related policies are not adequate in terms of their coverage and plan of action. The Policy does not provide any guidelines on how to recover grabbed land from powerful elites as well as how to distribute non-agricultural *khas* land to urban poor or landless.

### **2.3 Acquisition Related Policies**

The compulsory acquisition of land has historically been a difficult and delicate issue for governments in Bangladesh. Therefore, land acquisition and the concomitant resettlement process is almost always filled with tension. While authorities and economic actors highlight the conflict-ridden and inefficient aspects of the process, affected people emphasize on the disruption it brings about to them, even if in the name of a generic public good delivered to society as a whole (FAO 2008).

In addition to micro-level conflicts relating to implementation of specific projects and the communities impacted by those, land acquisition processes generate disputes at a higher level when associated with possible differential uses of lands. Bangladeshi law does not distinguish between processes governing the acquisition of farmland and urban lands. While the Industrial Policy of Bangladesh addresses the potential conflicts emerging from uses of farmland (especially fertile and prime agricultural lands in a predominantly rural economy) for industrial purposes, there are no effective mechanisms to ensure the application of the principles put forth in the policy. It thus offers a challenge when large footprint projects are to be implemented in green-field areas, industrial estates, special economic zones or export processing zones.

The current legal instrument for expropriating lands for public purposes is the Land Acquisition and Requisition of Immovable Property Ordinance, 1982. The 1982 Ordinance has roots in the British colonial Land Acquisition Act of 1894 that laid the basis for the practice of land acquisition in South Asia during the colonial and post-colonial periods. As it stands, the 1982 Ordinance presents significant challenges in its application, as it is based on compensation rationale only. As such it monetizes productive (for ex: land) or important assets (houses) at rates that are not based on market valuations and it provides affected people with a promise (often not delivered in full) of a payment later for an asset foregone today.

No process of consultation with affected communities is envisioned in the law. Because of this and other issues, the Ordinance fails to provide a solid ground and clear-cut policies on which implementing agencies of the Government of Bangladesh (and increasingly PPP types of arrangements for public infrastructure development) can implement public infrastructure projects to sustain growth and development. Bangladesh does not have a resettlement policy or law to address the array of problems faced by people due to implementation of development projects, particularly in moving residence from one area to another (Zaman 1996, Zaman et al. 2008).

The process of acquiring lands in Bangladesh is extremely cumbersome as it involves as many as 22 steps and multiple government bodies and agencies for implementation. The payments to affected people are seldom delivered on time—even when they are delivered they reach the affected person not in full in most cases due to well-known rampant corruption (CARE 2003, Zaman 1996). Compensation rates and mode of payments in installments often create tension among the resettlers. Therefore, a comprehensive and modern technique of resettlement needs to be adopted in order to smooth acquiring of land.

### **2.3.1 Land Survey Tribunal**

To dispose of the suits arising out of the final publication of the last revised record of rights, the Land Survey Tribunals have been established in the country. By the Act no. IX of 2004, chapter XVIIA, Land Survey Tribunal and Land Survey Appellate Tribunal was incorporated in the State Acquisition and Tenancy Act 1950, describing the powers and procedure for these Tribunals. The Tribunals established under this law are mostly incapable of providing the deserving remedies to the litigants due to insufficiency in the provisions described in Chapter XVIIA. Section 145D of this chapter laid down the power and procedure of the Tribunal where it was provided that for the purposes of disposal of suits or appeals, a Land Survey Tribunal or a Land Survey Appellate Tribunal shall exercise the powers and follow the procedure under the Code of Civil Procedure 1908.

Section 145I provides, 'the Government may, by notification in the official Gazette, make rules for carrying out the purposes of this Chapter'. *However, this rule is yet to be made by the Government though it is vitally important to continue Tribunals' proceedings smoothly as well as ensure justice in the suits tried by the Tribunals* (Mamunur Rashid, The Daily Star, January 13, 2004). Despite lack of adequate laws, the Tribunals are continuing judicial proceedings and promulgating final judgements. Under the prevailing provisions, in the event of death of any party in the suit, the Tribunal cannot substitute the successors of the deceased or strike out the name of deceased. It is also unable to add any new party in the suit that may be required for the sake of justice. An 'inherent power', which is exercised by the civil Courts in absence of any specific provision and for the sake of justice, has not been conferred on Tribunals. However, the Tribunals trying the suits related to the vested properties are exercising such powers.

It is often alleged that in many cases, the Sardar Amins as well as the Revenue Officers prepared the record of rights completely with false details by taking unfair means. The influential people got the record of rights prepared as they wanted. Without any local inspection or investigation on the spot, it by no means is possible to ascertain the real truth as well as ensure the justice. But the Chapter XVIIA does not include any provision to appoint any

commissioner for investigation or inspection of the suit land. As a result, it can in no way carry out the purposes behind this enactment.

#### **2.4 Economic Zone Act, 2010**

To ease land-related problems faced by potential investors, the Government has enacted Economic Zone Act in 2010. The act provides legal basis for the establishment of economic zones in all potential areas including backward and underdeveloped regions with a view to encouraging rapid economic development through industrialization. The development of Economic Zones is expected to help investors find a place with various facilities that are conducive for industrial development. The Act promotes Economic Zones in the Private sector, Government led EZs or in a combination. In this connection, Bangladesh Economic Zone Authority (BEZA) has been established. The mandate of the BEZA is to identify local potential zones, acquire lands and build the zones with necessary facilities. BEZA may seek public-Private Partnership (PPP) to build and effective utilization of such zones.

## Chapter 3

### Land Administration and Management

This chapter discusses the current land administration and management system in Bangladesh, its problems and suggests ways to improve the situation.

#### 3.1 Current Land Administration

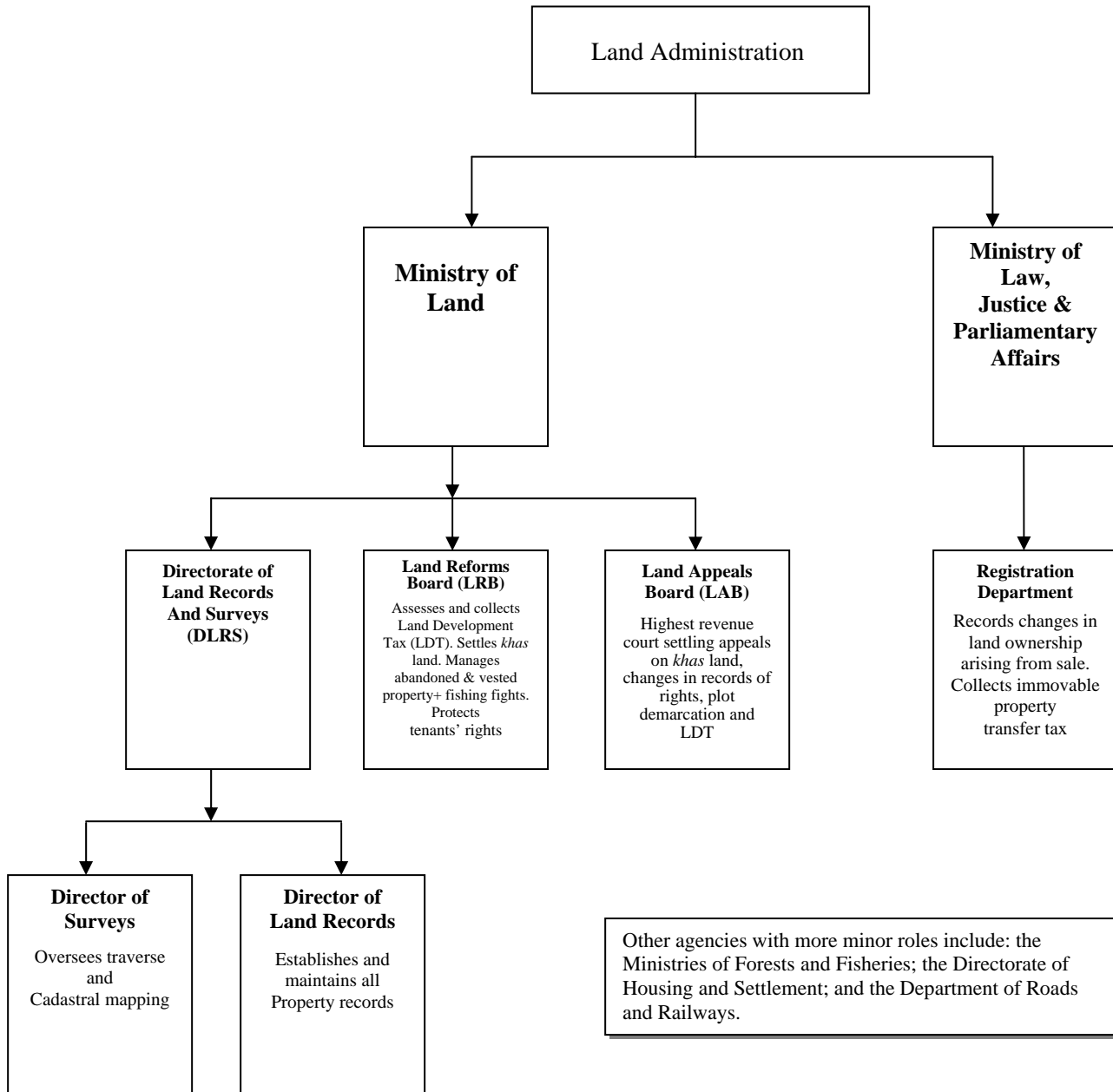
The current administrative structure of land management in Bangladesh is built around three core functions: (i) record keeping, (ii) registration, and (iii) settlement. The core functions of land administration are maintained by various departments of two Ministries, The Ministry of Land (MoL) and the Ministry of Law, Justice and Parliamentary Affairs (MLJP). While the MoL discharges most of the land-related activities including survey, collection of land development tax, arbitration process, the MLJP mainly records land mutation and transfers. The following four departments conduct the core functions of land administration in Bangladesh:

- The Directorate of Land Records and Surveys (DLRS) in the MOL conducts cadastral surveys, from which it produces *mouza* (revenue village) maps showing individual plots of land and *khatian* (individual land record certificates);
- The Land Reform Board (LRB), also in the MOL, discharges its functions through Upazila Land Offices and Union *Tehsil* offices. It administers *khas* (public) land, and manages abandoned and vested property. It updates maps and land records between surveys and sets and collects the Land Development Tax (LDT). It is also formally responsible for the implementation of land reform legislation and the implementation of tenant's rights<sup>3</sup>;
- The Land Appeal Board (under the MOL), is the highest revenue court to serve as the final arbiter in matters of *khas* land, changes in records, plot demarcation and taxation. As such, it represents the final link in a chain running upwards from the Assistant Commissioner (Land) and the Nirbahi Officer at the Upazila, through the Additional Deputy Collector (Revenue) and the Deputy Revenue Collector at the District;
- The Department of Land Registration (DLR) in the Ministry of Law, Justice and Parliamentary Affairs records land mutations arising through sale, inheritance or other forms of transfer, reports changes to the Ministry of Land, and collects the immovable property transfer tax (IPTT).

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<sup>3</sup> In Bangladesh, land ownership is managed in two ways. First, cadastres and ownership are investigated through surveys, and then *mouza* map and *khatian* are prepared. Second, the AC (Land) Office of the Upazila prepares the mutated *khatian* based on land transfers or inheritance.

**Figure 3.1: Land Administration at National Level**



The main task of the land administration is to conduct land surveys and maintain a clean record of land in an efficient manner. In Bangladesh, to investigate cadastre and ownership, three surveys, namely CS (Cadastral Survey, 1888 - 1940), SA (State Acquisition Survey, 1956 - 1962) and RS (Revisionary Settlement Survey, since 1965) were conducted. The survey process usually takes fairly longer time to complete surveys and regional surveys—12 years to 15 years in particular as the whole process includes visit of the site, investigating the cadastres and ownership and preparing the *mouza* map and *khatian* (CARE, 2003). Nonetheless, the survey is also not free from distortions due to inefficient and corrupt practices of field surveyors.

A disintegrated land administration is also a cause of concern. At the lowest tier, the function of record keeping is done by *Tehsil* office, while registration is done by Sub-registrar's office. There is an altogether different office which handles the function of land settlement. The current land administrative system is not integrated in the sense that ownership rights are recorded in three different offices, each of which is run through a completely different executive process. While the *Tehsil* office is linked to the Ministry of land, the sub-registrar's office lies within the jurisdiction of the Ministry of Law and Parliamentary Affairs. In addition, the land settlement is done by completely separate office. This disintegrated system is believed to be one of the main sources of hassles for the stakeholders.

### **3.2 Bottlenecks of the current land administration system**

The diversity of ways by which land records is updated and the problems associated with each, give rise to numerous disputes in which the rich and powerful inevitably enjoy the upper hand. At present the responsible ministries and agencies involved for land management and administration work independently with little coordination among them. The whole process is manual, laborious and time intensive. Conventional methods of land survey, preparation and upgradation of land records, maintenance of all related data for each parcel of land makes land administration and management inadequate and inefficient. Moreover, distortion of land records at various stages (i.e. plot-to-plot survey, preparation of records and drawing of maps through conventional methods, objections, junk/checking works, printing, etc.) hinder land development control and property tax collection.

The current system of land administration and management appears to be inadequate and inefficient for a number of reasons:

#### *1. Record of Rights (ROR):*

*Khatians* are not conclusive evidence of ownership, and these merely provide basis for possession at the recording time. Under the prevailing legal system, *khatians* along with deeds and mutation documents are relevant for ownership decision by a Civil court (Mia, 1996). The lengthy and complex process of ownership determination enhances conflicts. The present system of registered transfer deed of land does not prove ownership or transferable rights of the seller; it rather invites the risk of false transfer (Aziz, 2003). Isolated maintenance of registration deeds and delay for sending land transfer (LT) notices to the AC (Land) office by the Registration office makes mutation and eventually the upgrading of ROR a lengthy procedure. As a result, it requires revisional settlement for updating land record that is more complex and time consuming. All the current stages of conventional preparation of ROR are vulnerable to tampering and distortion.

The current system produces multiple *Khatians*. The *khatian* is administered separately by DLRS, the DC Record Room, the AC (Land) office and the *Tahsil* Office. Also, the *khatian* managed by DLRS may differ from the mutated *khatian* managed by the AC (Land) Office. If there is an ownership dispute, it is difficult to verify land ownership. The *khatian*, prepared by DLRS, can be printed for management. But the mutated *khatian* that is prepared by the AC (Land) is being prepared manually. If the book is recorded manually, some information, other than zone information, e.g. repeated information, may be omitted.

To overcome the problems related to disintegrated land record system, a digitized system has been introduced. The current digital system is used for inputting the *khatian* records in the e-

Service Center and DLRS, and printing the information. The current system is available at the e-Service Center located in DC or Upazila, and mainly used for the issuance of the *khatian*. However, the system only allows taking a print out of it, but cannot manage changes. For preserving land records digitally, the current system may be effective, however, for maintaining up-to-date record keeping in an integrated manner, a broader land information system (LIS) needs to be developed. Without having an integrated digital record system with a central server, it is expected that lack of coordination and inefficiencies in managing and maintaining land record keeping will prevail.

## 2. *Registration:*

Inadequate and improper land registrations increase difficulties in securing land tenure and land transfer in Bangladesh, as deed system does not provide the final proof of the proprietary right. There is no provision of compensation if any loses occur to some person due to mistakes or errors in the deed. These result large-scale fraud and forgery related to land sale registration. Moreover, as many argued, there has been notable corruption in Registration Offices during deed registration (Alam, 1992; Hossain, 1995), which increases the sufferings of the common people and acts to deprive the government of receiving its due fees.

There is a wider tendency of reporting lower than actual price of land during the time of registration mainly for avoiding IPTT. There are also evidences of overpricing of land to get higher amount of bank loan for land development. Corruption and bribery happens widely in *Tehshil* offices at the time of mutation. The mutation records can be distorted either during survey and settlement operations or due to false report of the *Tehsildars*. Inadequate capacity of the Settlement Press for printing land records and poor quality of record maintenance also aggravate the inefficiency of the existing system.

### **3.3 Improvement of Land Administration and Management System**

For efficient and appropriate land management system, maintenance of updated land ROR is very important. To address the inefficiencies involved, it is important to integrate all ownership information and allow all related agencies to share the same up-to-date information.

To improve the land administration and management system, there are various solutions as suggested by stakeholders. While some of the solutions appear to be long-term by nature, some are short-term. It is not possible to change the current administrative structure overnight to solve all the problems considering various difficulties involved with it. Rather, an IT solution can be sought to integrate the system and allow easy and quick fix of problems.

#### **1. Development of Land Information System**

A well-developed land information system (LIS) is important to facilitate quick capturing, retrieval and querying of different cartographic information. Land administration and management, land use control, provision of utility services and other services can be pursued by computerized LIS. This system would serve unified services related to land management by marginal labor, time and money. Use of LIS for recording and maintaining the original volume of land records could minimize the chances of tampering of records. If any change in the ownership is updated in real time through the computer-based system, agencies can manage the ownership ledgers in a unified fashion and allow anyone to check the current ownership information any time they want. Once an accurate geodetic framework and cadastral system has

been developed, many analysis of land-tenure change could be performed with the assurance of high degree of measurement accuracy. This will help arrive at compatible multiple land uses within selected parcel of land.

However, development of an integrated LIS is not an easy task and it will require a fairly longer time, say 5-10 years. LIS is a bifurcation of GIS, which is most often based on the ownership, management and analysis of portion of the earth. LIS application combines both traditional survey methods and Global Positioning System (GPS), a sophisticated satellite system for acquiring the local information on land (Demers, 1999). The Cadastral Survey (CS) and Mapping methodology based on ground survey or aerial survey supplemented by ground survey is to be adopted. Completion of these operations would provide digital *mauza* maps. Using Satellite navigation systems or GPS, surveyors collect field data using portable backpack or hand-held devices. In this process, they use signals from GPS satellites to work out the exact location on the earth's surface. Most GPS receivers store collected co-ordinates and associated attribute information in their internal memory, so they can be downloaded directly into a GIS database (Heywood, *et. al.* 2002).

LIS could introduce a unified cadastre that is a broader concept to incorporate information related to positioning of land, land size and orientation, land ownership, land use etc. This is a large scale, community oriented land information system to serve both public and private organizations concerned to land administration and management, land development and service provision. Despite the huge installation and recurring cost of new technologies, once the land record is completely computerized, various space-specific parameters could be hooked-up to the land record (Nahrin and Rahman, 2009). The same record could be utilized for various purposes such as taxation, subdivision planning and other tasks in urban, rural and regional level. For this purpose, demand responsive step-by-step approach within a timeframe would bring the effective results for land administration and management through LIS.

## **5. Integrate Land Records Management through DLRS**

To provide up-to-date *khatian* records, it is necessary to compile data scattered throughout different agencies in one place and prevent generation of overlapping data from different locations. Doing so requires the agencies handling land registration information to have necessary information infrastructure and a separate organization to manage the task. Currently the Bangladesh government manages the cadastral and ownership information at the same time. But the governments in most developed countries manage the cadastral information separately from ownership information in their land registration offices, while allowing real-time revisions in data. Through a digitized integrated system, land records collected from government agencies, external administrative units and local autonomous bodies will go directly into the integrated database and will enable to provide a variety of services including the real estate registration system, portal systems for people, kiosks, and mobile services.

The focal institution for integrated land management should be the Department of Land Records and Surveys (DLRS). Through these services, related agencies such as the AC (Land) Office, the Settlement Office and Sub-Registrar can update their databases by linking with the newly generated data in real time and thereby handle all land-related tasks including taxes, documentation and statistical information as well as *khatian*. The agencies can also eliminate the time-consuming job of sending and receiving copies of documents among themselves and instead view up-to-date *khatian* records. People who need land ownership-related documents



can view or receive *khatian* through a one-stop service (a single point) provided by DLRS without visiting other offices. By establishing a countrywide network for land records, people can view information and get all *khatian* documents anytime and anywhere from e-Service Centers. The system, if developed properly, should have the provision of notifications of ownership change and tax-related information in real time.

While this integrated land management system appears to provide a hassle-free service to some extent, this cannot be done without having a well-developed LIS.

## **6. IT Capacity Development for Information Management**

In most of the developed countries, there is a primary agency responsible for managing information within an organization handling land registration jobs. Such an agency deals with responsibilities like land registration information, digitization planning, IT system installation and operation, acquisition of resources and infrastructure as well as management of land ownership information. A dedicated IT section or agency could be created within the DLRS for handling land records including *khatian* while managing resources (workforce, technology, and infrastructure) for land records services with adequate capacity in information technology.

## **7. Develop Alternative Dispute Resolution (ADR) Mechanism at the local level**

The need of ADR may be viewed from three different perspectives: (i) interest of the state; (ii) interest of the stakeholders (judges, lawyers, mediators and litigants); and (iii) public perception. Since the country's judicial system is flooded with unmanageable pending cases—most of which are land related, in the context of its limited number of judges, inadequate judge-population ratio, insufficient budget allocation for the judiciary and lack of infrastructure in the legal system, the reliance on ADR becomes just a demand of the time. Given that many developed and developing countries have gained tremendous success in reducing pending cases by adopting ADR, Bangladesh should find and try ways and means to develop ADR modes in the same fashion.

Provision for ADR have been incorporated in the code of civil procedure, 1908 by amending act titled The civil procedure code (Amendment) Act 4 of 2003, Sections 89 A and 89 B provides for 'Mediation' and 'Arbitration' respectively as alternative means of settling disputes within existing civil court system, which bestow upon the Judges, the authority and motivation to call upon the litigants utilize them. The mentioned sections provide that after filling of the written statement to the court, if all the detesting parties or their pleaders are in attendance in the court and are willing to settle their dispute through ADR, the court may adjourn the hearing and mediate in order to settle the dispute to a mediator from the panel prepared by the District Judge. Act 8 of 2006, section 89 C Provides FIR mediation in appeal. In mediation under this section the Appellate court as far as possible follow the provisions of mediation as content in section 89 A by necessary changes may mediate in an appeal or refer the appeal for mediation in order to settle the dispute or disputes in that appeal.

Considering overwhelming disputes in land surveys and records, it has long been suggested by different stakeholders and emphasized in previous policy documents for effective engagement of Local government bodies, NGOs, civil societies and peasant organizations (CSOs) for better land management and reforms (see Saha, B.K., 2010). In case of any disputes arising during land survey and recording, it can be resolved with the help of NGO, CSO and local government

bodies such as Union Parishad (UP) representatives. If the disputes are related to boundary and simple in nature, it can be resolved through village court at the UP. This type of land dispute resolution mechanism needs to be developed, which will help reduce volume of land related court cases.

## **8. Overall improvement of land governance**

Land governance concerns the rules, processes and structures through which decisions are made about the use of and control over land. This also refers to the manner in which the decisions are implemented and enforced, and the way that competing interests in land are managed. It encompasses statutory, customary and religious institutions as well as covers both the legal and policy framework for land as well as traditional and informal practices that enjoy social legitimacy.

As already discussed, weak land governance leads to many tenure-related problems in Bangladesh. Improving land tenure arrangements often means improving land governance. An understanding of land issues from a governance and political economy perspective can be derived through a five part framework (LGAF) of the World Bank: (i) legal and institutional framework related to tenure and markets; (ii) land use planning, management and taxation; (iii) management of public land; (iv) public provision of private land, and (v) dispute resolution and conflict management. These issues are discussed in this paper and a few areas of reforms are highlighted on the basis of discussion:

- Revision of National Land Use Policy harmonizing other cross-sectoral policies
- Digitization of land record system and gradual development of Land Information System
- Land zoning and creating special economic zones
- Preparation of *khash* land inventory
- Dispute resolution mechanism involving NGOs, CSOs etc.

The review of global experiences from a governance and political economy perspective reinforces the fact that many land sector problems are highly complex, politically sensitive and difficult to resolve. At the same time, it suggests that a more flexible long term strategy may be more appropriate for reforms in the land sector. It emphasizes the importance of blurring the distinction between reform design and implementation to enable policymakers to take advantage of new information and understanding that is generated through the reform process. Specific strategies for reforms as well as a continuous information and outreach strategy should be in place. The bottom line is that while land sector reforms are indeed challenging, many of them may contribute to improving the overall quality of governance in a country.

## **3.4 Conclusion**

The current disaggregated process of land administration creates various problems in land management including lack of coordination and efficiency in the system. Such a system proliferates and perpetuates the endemic nature of land disputes. It has been estimated that nearly 80 percent of court cases in the rural areas are related to land-conflicts. The current

system is often viewed by stakeholders as time-consuming and costly, as well as a cause for potential land disputes.

Digitization of land record is one of the solutions to minimize disaggregation/disintegration problem that lies with the current system. To this end, digitization of land records is now being implemented with support from various donors, but the progress is not satisfactory. Digitization of such records will reduce hassles of stakeholders and it will help create an integrated system of land records. Any agency that needs information regarding land ownership would be able to verify and obtain that information. To reap the benefit of the digitized record system, one must have to be careful about the flawless inputs of records. It is also important that the donors or agencies that are implementing the relevant projects should have some sorts of coordination among them for better management of works. Therefore, the ultimate objective should be to develop an integrated Land Information System (LIS) involving both land survey and land record keeping system.

# **Chapter 4**

## **Land Zoning and Sustainable Land Management**

### **4.1 Introduction**

Land management is the process by which the resources of land are put to good effect. It covers all activities concerned with the management of land as a resource both from an environmental and economic perspective. It can include farming, mineral extraction, property and estate management, physical planning of towns and the countryside. On the other hand, sustainable land management is a knowledge-based procedure that aims at integrating the management of land, water-bodies, biodiversity and other environmental resources to meet human needs while sustaining ecosystem services and livelihoods. In the context of climate change and growing investment demand, the issue of sustainable land management stands to receive greater attention in Bangladesh.

Planned use of scarce land is crucial for overall development of a country like Bangladesh. Rapid population growth, improper land use and ineffective implementation of existing laws and guidelines are some of the reasons for which it is necessary to create a “Land Zoning Map” throughout the country as has been emphasized in the Land Use Policy, 2001. Unplanned agricultural practices and encroachment on forest areas for agriculture and settlements also put pressure on scarce land resources. Unplanned rural infrastructure development and the growing demands of increasing urbanization are also devouring productive agricultural land. These issues make “land zoning” particularly important for integrated planning and sustainable management of land resources of the country. Land zoning would provide businesses access to land for potential investments, which will facilitate industrialization of the country. These issues are discussed in this chapter.

### **4.2 Land Zoning and investment**

The impact of scarcity of land is being felt in different areas of investment, both local and foreign, in new industrial and commercial ventures. While the domestic investors can manage land for their ventures, the cost of the same tends to make their projects economically not viable. The foreign investors, however, is entirely dependent on government cooperation to select or acquire suitable land for their ventures. But the government is in difficult position to make suitable land available for building industrial or other ventures by foreign investors. In recent years, many FDI proposals could not be entertained due to problems in allocating suitable land. Land scarcity continues to dampen the investors' enthusiasm.

#### *Land Zoning Maps*

For any industrial or commercial venture, location is an important factor. To ease land-related problems for potential investors, the GoB has been implementing a project to prepare land zoning maps across the country in order to identify potential land for investors. Subsequently, the government enacted Economic Zone Act in 2010 to make best use of land for investors.

Competition for diverse uses of land resources, tremendous increase of population, natural and man-made hazards, economic opportunities and ecological hot spots call for distinctive and

sustainable land management through the development of land-use based Zoning in the country. Under the Land Zoning Project of the Ministry of Land, coastal land zoning project has been undertaken in 21 districts, including 19 coastal districts for protection of environment and ensuring modern and scientific land management. Land zoning activities in 40 more districts is now underway and is expected to be completed by 2015.

#### *Special Economic Zones:*

Bangladesh lags far behind many other comparator countries in setting up economic zones (EZs). Vietnam has built more than 400 economic zones since 1990s, while China, Malaysia and Indonesia have hundreds of such zones for their investors, both local and foreign. Myanmar is also making fast progress to catch the waves of global investors.

Even several years after the enactment of separate laws for such zones, works for developing EZs in the country are moving at a snail's pace. However, five EZs are scheduled to go into operation by 2016. There are differences between the export processing zones (EPZs) and Special Economic Zones (SEZs). Only export-oriented products are manufactured in the EPZs, but all types of goods will be produced in the SEZs. Special Economic Zones are expected to create increased linkages with the domestic economy by widening and strengthening Bangladesh's experience with Export Processing Zones (EPZs). The government is expected to provide land and utility, while investing companies will develop the infrastructure on their own. While BEZA has so far finalized 11 sites across the country for establishing economic zones, among them five special economic zones are expected to be completed in the next two years to attract both foreign and domestic investments. Four SEZs will be set up under the government's Bangladesh Economic Zones Development Project at a cost of Tk 81.95 crore in Mongla, Moulvibazar, Chittagong's Anwara and Mirersorai areas.

In addition to attracting foreign direct investment, the proposed economic zones are purported to bring millions of dollars investment from Bangladeshi diaspora. If all such things happen, the SEZs will certainly be able to generate a substantial number of jobs and boost the domestic economy. The spill-over effects of the SEZs in the form of job creation, investment and transfer of management skills and technology will be much greater than those from traditional industrial parks.

To ensure access to land for specific purpose in SEZs, proper act and policies and their proper enforcement and implementation need to be underscored.

- It is necessary to ensure that land in specific zones is used for determined purposes and for this a detailed guideline need to be adopted;
- The government should provide specific regulations on administration and use of land within the zones;
- The zones could be used for setting up of big, medium and small industries or establishments—both for local and foreign investors with strict scrutiny;
- SEZs should be based on feasibility and pre-feasibility studies. Both domestic and foreign investors should get equal facilities in the SEZs;
- Environment Impact Assessment (EPA) must be in order to ensure that natural resources are not damaged due to the economic zones;

- The experience of the Bangladesh Export Processing Zone Authority (BEPZA) can also be drawn upon, while advancing such Economic Zones;
- The GoB has several industrial plots under the Bangladesh Small and Cottage Industries Corporation (BSCIC) that are lying underutilized and also has substantial areas of land, falling under the operational jurisdiction of many state-owned enterprises (SoEs) that have a poor performance track record. These land areas can be used for setting up of SEZs.

Foreign Direct Investment (FDI) is largely contingent upon suitable land allocation, which can be solved by establishing SEZs. However, if SEZs are not set up right in time, Bangladesh is expected to miss the investment opportunities. The problem of land scarcity and also that of its affordable cost will present a daunting challenge for operationalizing the EZs. Enforcement of stringent control over effective use of land and proper registration across the country is, meanwhile, considered an urgent need for planned future urbanization and industrialization.

### **4.3 Sustainable Land Management (SLM)**

Sustainable Land Management is defined as “the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions” (UN Earth Summit, 1992). TerrAfrica (2005) has further defined sustainable land management as “the adoption of land use systems that, through appropriate management practices, enables land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources”. Sustainable Land Management is thus crucial to minimize land degradation, rehabilitate degraded areas and ensure the optimal use of land resources for the benefit of present and future generations.

Sustainable land management approaches require collaboration and partnership at all levels—land users, technical experts and policy-makers—to ensure that the causes of the degradation and corrective measures are properly identified, and that the policy and regulatory environment enables the adoption of the most appropriate management measures. SLM is considered an imperative for sustainable development and plays a key role in harmonizing the complementary goals of production and environment. Thus the most important aspects of SLM is the critical merger of agriculture and environment through twin objectives: i) maintaining long term productivity of the ecosystem functions (land, water, biodiversity) and ii) increasing productivity (quality, quantity and diversity) of goods and services, and particularly safe and healthy food.

To operationalize the sustained combination of these twin SLM objectives, it is essential to understand drivers and causes of land degradation and to take into account of current and emerging risks. SLM encompasses other established approaches such as soil and water conservation, natural resources management, integrated ecosystem management and involves a holistic approach to achieve productive and healthy ecosystems by integrating social, economic, physical and biological needs and values. At this backdrop, Ali et al (2012) identified several reasons that are crucial for sustainable land management in Bangladesh:

1. Use pattern of resources is changing mainly because of various forms of tenural system that are now taking place;

2. Land fertility has been declining due to unbalanced use of fertilizers, irrigation and pesticides;
3. Productivity of land varies depending on the use of inputs; and
4. Variations in soil quality, fertility, input use and productivity across regions.

In order to ensure SLM in Bangladesh, the following four common principles need to be met:

- Land-user-driven and participatory approaches;
- Integrated use of natural resources at ecosystem and farming systems levels;
- Multilevel and multi-stakeholder involvement; and
- Targeted policy and institutional support, including development of incentive mechanisms for SLM adoption and income generation at the local level.

The following measures are required for SLM:

- Capacity development
- Mainstreaming
- Elaboration of the National Action Program against desertification
- Produced a Medium-Term National Investment
- Plan and coordinated resource mobilization
- Plan for sustainable land management

#### **4.4 Distribution and Management of *Khas* land**

The government undertook policy to distribute *khas* land to landless poor since the mid 1980s. The government distributed agricultural *khas* land (only the part which is officially shown as "identified") at various amounts as follows: 0.37 acres per landless household, ranging between 0.72 acres in Sylhet division and 0.2 acres in Rajshahi division. Similar variations are evident by districts also. Similarly, equal distribution of *khas* water-bodies yields 0.38 acres per landless household, ranging between 1.68 acres per landless household in Barisal division and 0.13 acres in Chittagong division. Equal distribution of all types of *khas* (land and water bodies) land yields an amount of 1.52 acres per landless household ranging between 4.81 acres in Chittagong and 0.73 acres in Dhaka and Rajshahi divisions. On average, district wise *khas* land (agriculture and non-agricultural excluding the waterbodies) figure is 1.14 acres of land per landless household, while for agricultural *khas* land it was 0.37 acres per landless household. There are at least 14 out of 64 districts in which *khas* land (agricultural plus non-agricultural) per landless household exceeds 1 acre.

However, the main criticism is that about 20 percent of the direct beneficiaries of *khas* land comprises of those who are not entitled to receive the *khas* land. The whole process of listing of landless was not transparent in the sense that many people were not at all aware of the process. The landless themselves were not involved in the process. Moreover, the local influential people influenced the listing process.

*Khas* land distribution is mainly a post-liberation phenomenon. Most of the land what has been distributed so far has taken place during 1981-1996 period (Barakat et al, 2000). The relative intensity of distribution was high during 1991-96 (56% in 7 years), followed by 1981-90 (36% in 10 years). Both the government officials and public representatives were the principal actors in the delivery mechanism of *khas* land. The local influential people are also important actors in the delivery mechanism of *khas* land.

Although there is a provision in the law to form cooperatives on large compact blocks of *khas* land, this did not work in the past for varied reasons. The main reason was illegal occupation of large blocks by influential people. The Land Reform Policy of 1987 itself recognizes that "the Ministry feels that it may be very difficult for the destitute landless in this society surrounded by the selfish land-grabbers to retain the land given under settlement". This issue needs to be resolved soon from poverty reduction and equity concerns.

Adrasha Gram (AG) Project was one of the successful projects in terms of *khas* land distribution among the poor landless households. The project was financed by the European Commission (EC) and maintained by GoB. AG project was considered successful and served as an example not only for AG-II but also for other GoB settlement schemes. AG-II (Phase-II) has only reached two-third of the originally envisaged 650 villages and two-third of the envisaged households. The low effectiveness was mainly due to inefficient management (Evaluation Report, 2008). The AG-I project has achieved its targets during 6 phases as follows:

- Phases 2-5 with support of the EC: 622 villages and 31206 families settled and
- Phases 1 and 6 without support of the EC: 427 villages and 14441 families settled.

In total 45647 families in 1049 AG-I villages have benefited from the program. However, the evaluation Report prepared by the European Commission suggests that selection of poor households for the AG project was problematic and in many cases poorest of the poor did not get place in AGs. For sustainability and replication purposes, recommendations made by independent evaluations need to be considered.



## **Chapter 5**

### **Conclusion and Policy Recommendations**

The challenge of land administration is to ensure access to land and property rights through planned and sustainable land management in Bangladesh. The existing land administration and management can be characterized as an uncoordinated/disaggregated executive system which entails a complicated and time consuming land survey and record keeping process. It has been mentioned in many documents that almost 80 percent of court cases in rural areas are related to land disputes, for which the responsibility mainly lies with the current system of land administration. The land administration is backdated and it lacks proper land information system. The system is disintegrated which is often responsible for errors in ownership records. The ownership rights are recorded in three different offices, each of which is run completely by different executive process. The uncoordinated executive processes are the source of most of the problems of land administration in Bangladesh, which leads to endemic nature of land disputes. Thus, the importance of an efficient land administration and management in a country like Bangladesh cannot be ignored.

Land management is a complicated process in Bangladesh. Ownership records are verified through surveys of land owners and neighbors, and the Settlement Office confirms the results of surveys and records them in the *khatian*. Surveys used to take more than 10 years. Accordingly, it is difficult to correctly understand the actual ownership in real time through survey. The land resource inventory, monitoring and updating of land use in the conventional way through a field survey is very expensive and the existing methods used to perform this work requires comparatively longer time.

Aside from complicated land administration system, the rate of land conversion puts tremendous pressure on agricultural land for the use of non-agricultural purposes including housing and business. Thus, in search of potential land for investors, following recommendations made in the National Land Use Policy, 2001, Land Zoning Maps are now being prepared using present and potential land uses with the help of Local Government Bodies and field level government offices. While zoning of coastal areas have been completed, it is expected to be completed for other districts by 2015. The digitization of land records is being implemented by several government agencies with the help of ADB and Korean Firms, but the progress of the work is not satisfactory. Another project titled “Capacity Building and Resource Mobilization for Sustainable Land Management” is being implemented by the Ministry of Environment and Forest in collaboration with Ministry of Agriculture and Ministry of Land. The European Union has been implementing a project titled “Access to Land and Property Rights” under which digitization of land records is underway on a pilot basis in some Upazilas. In addition, the project is working on the revision of the National Land Use Policy. The completion of these important projects would have important policy implications on overall land management and administration during the Seventh Five Year Plan in Bangladesh.

## Recommendations for Seventh Five Year Plan:

### A. Operational:

1. **This study suggests that an IT-based solution could be optimal to handle uncoordinated and disaggregated executive process of land administration.** Through a digitized integrated system, land records collected from government agencies, external administrative units and local autonomous bodies will go directly into the integrated database and will enable to provide a variety of services including the real estate registration system, portal systems for people, kiosks and mobile services. The focal institution for integrated land management should be the Department of Land Records and Surveys (DLRS). Through these services, related agencies such as the AC (Land) Office, the Settlement Office and Sub-Registrar can update their databases by linking with the newly generated data in real time and thereby handle all land-related tasks including taxes, documentation and statistical information, as well as *khatian*. The system will reduce time and cost in receiving services as well as is expected to reduce number of land-related disputes. For implementing the system, coordination among different government agencies as well as different donors is needed. Although several IT projects are underway, IT-based land management system should be completed during the 7<sup>th</sup> Five Year Plan period.
2. **Only digitizing record keeping system may not uproot all the land-related problems unless the survey process is made flawless and less time-consuming. As a long-run objective, it is important to develop a process of comprehensive Land Information System (LIS).** It is easy to facilitate quick capturing, retrieval and querying by holding different cartographic information by applying land information system (LIS). This provides different tools to perform different analyses. As a result, LIS could suit with the spontaneous land conversion and title change in the country. Once an accurate geodetic framework and cadastral system have been developed, many analysis of land-tenure change could be performed with the assurance of high degree measurement accuracy. This will help manage compatible multiple land uses within selected parcel of land. Use of LIS for recording and maintaining the original volume of land records could minimize the chances of tampering of records. Although it may take several years to adopt LIS, the task can be started during the Seventh Five Year Plan period.
3. **A proper alternative dispute resolution (ADR) mechanism can be catalytic to minimize land-related disputes and court cases.** Considering overwhelming disputes in land surveys and records, it has long been suggested by different stakeholders and also emphasized in previous policy documents for effective engagement of Local government bodies, NGOs, civil societies and peasant organizations for better land management and reforms. In case of any disputes during land survey and recording, it can be resolved with the help of NGO, CSO and local government bodies such as UP representatives. If the disputes are related to boundary and simple in nature, it can be resolved through *village court*. This type of alternative dispute settlements could minimize the volume of land-related court-cases. A high level committee can be formed to analyze the land related disputes and provide proper recommendations on ADR that can be applied effectively.

4. **Considering scarce land and growing demand for investment, Land Zoning is an ideal option as many comparators are now pursuing so.** Rapid population growth, improper land use, and ineffective implementation of existing laws and guidelines are some of the reasons for which the necessity of creating a “Land Zoning Map” has been felt in the Land Use Policy, 2001. Integrated planning and sustainable management of land resources of the country have laid the importance and modalities of National Land Zoning. However, the progress of land zoning is far from satisfactory, that’s why it needs to be completed by 2015 as it intends to. Moreover, the planned construction of some special economic zones by 2016 must be completed by the timeline to take benefit of changing FDI scenario in Asia and Worldwide. To ensure access to land for determined purpose in SEZs, proper act and policies and their proper enforcement and implementation need to be underscored. It is necessary to ensure that land in specific zones is used for determined purposes and for this a detailed guideline need to be adopted and the government should provide specific regulations on administration and use of land within the zones.

## **B. Policy Related**

### **1. Revise National Land Use Policy**

Given the reality on the ground with respect to considerable landlessness, historical inequities, and widespread land grabbing, the land use Policy, 2001 failed as a tool for striking a balance between efficient and equitable utilization of land resources. The existing Policy falls short of providing guidance as to how cross-sectoral interests and plans relating to land should be coordinated. Given the limitations of the existing national land use policy, a revision of the national Land Policy is desirable during the Seventh Five Year Plan period in order to make it a comprehensive national policy by providing guiding principles on appropriate and sustainable use of specific type of land, sectoral and cross-sectoral land use and environmental management. The policy must take inputs from the ongoing land zoning maps in order to establish a guiding principle by addressing the multi-sectoral nature of land use and the prevailing confusion due to inconsistent policies on land utilization, unabated frictions among different sectors due to competing uses and negative environmental effects on land. For a conclusive Certificate of Ownership, it is important to rationalize the existing institutional framework for recording or registration of property rights and avoid mandates that are either overlapping or difficult to coordinate.

### **2. Efficacy of Land Tribunal**

For faster disposal of land related cases, it is important to ensure efficacy of the Land Survey Tribunals that have been established in 2004. By the Act no. IX of 2004, chapter XVIII, Land Survey Tribunal and Land Survey Appellate Tribunal was incorporated in the State Acquisition and Tenancy Act 1950, describing the powers and procedure for these Tribunals. The Tribunals established under this law are quite incapable of providing the deserving remedies to the litigants due to insufficiency in the provisions described in Chapter XVIII. As a result, it can in no way carry out the purposes behind this enactment. The reason mainly behind this is that according to the Section 145I, 'the Government may, by notification in the official Gazette, make rules for carrying out the purposes of this Chapter'; however, this rule is yet to be made by the Government though it is vitally important to continue Tribunals' proceedings smoothly as well as ensure justice in the suits tried by the Tribunals. Therefore, it is important to make these tribunals more effective through promulgation of necessary rules.

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## Appendix

**Table A1: Total land area of Bangladesh based on Landsat satellite data.**

Land cover type	1976		2000		2010	
	Area (mil. ha)	% of total	Area (mil. ha)	% of total	Area (mil. ha)	% of total
Agricultural land	13.10	91.83	12.74	87.69	12.44	83.53
Non-agricultural land	1.18	8.17	2.11	12.31	2.40	16.47
Total	14.28	100.0	14.85	100.0	14.84	100.0

**Source:** Landsat satellite data (SRDI, 2013).

**Table A2: An analysis of major land cover types in Bangladesh during 1976-2010, derived from Landsat imagery.**

Land Cover	Area (1976)		Area (2000)		Area (2010)		Yearly Average Change (%)		
	Mil. ha	%	Mil. ha	%	Mil. ha	%	1976-2000	2000-2010	1976-2010
<b>Agriculture</b>	13.303	91.83	12.74	87.69	12.17	83.53	-0.17	-0.42	-0.24
Cropland	9.76	67.38	9.43	64.96	8.75	60.04	-0.10	-0.49	-0.22
Forest	1.75	12.11	1.31	9.02	1.43	9.48	-0.13	0.08	-0.07
Mangrove	0.45	3.12	0.48	3.35	0.44	3.03	0.01	-0.03	-0.003
River	0.91	6.29	0.88	6.11	0.93	6.44	-0.01	0.03	0.004
Lake	0.50	0.35	0.58	0.40	0.51	0.35	0.002	-0.005	0.0001
Beel-Haor	0.23	1.66	0.25	1.73	0.25	1.72	0.003	-0.001	0.002
Tea	0.11	0.83	0.13	0.95	0.09	0.66	0.01	-0.03	-0.005
Salt Plan	0.12	0.08	0.02	0.17	0.036	0.25	0.004	0.01	0.005
<b>Non-Agriculture</b>	0.12	8.17	1.78	12.31	2.40	16.47	0.17	0.42	0.24
Rural Settlement	0.88	6.11	1.45	10.03	1.76	12.12	0.16	0.21	0.18
Urban & Industrial	0.27	0.18	0.047	0.33	0.08	0.60	0.01	0.03	0.01
Accreted Land	0.27	1.87	0.28	1.95	0.54	3.75	0.003	0.18	0.06
<b>Total</b>	15.67	108.17	16.31	112.31	16.97	116.47	0.17	0.42	0.24

Source: Hasan et al. (2013).

**Table A3: Definition of Land Types**

Land categories	Practical operational definition
Cropland	Cultivated crops i.e. paddy rice, field grown vegetable and other crops; seasonal (detected by examining seasonal pattern using multitemporal images), orchard, wet meadow or pasture land, fellow land
Hill forest	Deciduous (seasonal) and evergreen (permanent) forest vegetation; detected by high NDVI and location in hilly terrain
Sal forest	High seasonal NDVI (deciduous) and confirmed by specific map location, Modhupur tract and Barind tract
Mangrove forest	Year-round high NDVI, located along the coastal belt and tidal flats, and in designated reserved forest
Aquaculture	Ponds, ditches, excavated wetlands for traditional fish farming detected by water logging and specific visual patterns
Coastal salt pan	Solar extraction of sea salt, located along the southeast coastal belt and tidal flats
Rivers and estuaries	Water body generally highly turbid and showing linearity
Flood plains	The extent of land flooded by river channels in high flow seasons due to over-bank flooding; characterized by temporary to seasonal water logging (except hills, Akhaura terrace, Modhupur tract and Barind tract)
Kaptai Lake	Clear deep water body created by drowning of valley; confirmed by shape of mountain valleys
Beel, haor	Water body surrounding rural settlements and perennial vegetation; seasonal expansion and contraction; confirmed by map locations, saucer shaped water bodies in the north-east regions
Urban centers	Built-up and paved areas characterized by high reflectivity, high surface temperature, very low vegetation and confirmed by geographic locations (cities, districts towns, rural townships)
Rural settlement	Concentration of perennial vegetation including orchards and trees, homestead gardens, small ponds and occasional rooftops connected by rural networks
Road network	Network of national highways, wide city streets, district highways, embankment cum roads and all other roads connecting townships: not extracted from image but superimposed from existing GIS data
Industrial zone	Characteristics similar to urban centers and situated in urban or periurban locations detectable by large civil structures; includes EPZs, industrials areas
Accreted coastal land / char	Recently formed coastal sandbars, mudflats and upstream chars showing active geomorphological changes over time; sometimes succeeded by vegetation
Braided river channel	Dynamically active point bars and mid-channel bars inside wide river channels generally separated by deeper active channels
Erosion-prone zone	Shore land showing active geomorphological changes over time characterize by recent or ongoing loss of land to the river or sea
Others	Land types not falling in any of the above classe

Source: Hasan et al. (2013).

**Table A4: Chronology of major land use policies**

1972	A land ceiling of 33.3 acres is re-established and various presidential orders provide for the distribution of <i>khas</i> land amongst the landless. Expected that 2.5 million acres of excess land will be released, but in reality there is far less. Newly formed land vested in government, becoming a second type of <i>khas</i> . Exemption from land tax granted for families owning < 8.33 acres.
1976	A variety of land related charges are consolidated into the Land Development Tax (LDT), which covers the whole country except CHT, but deficiencies in the record system mean individual holdings cannot be checked, and switches to more heavily taxed non-agricultural uses frequently go unrecorded.
1984	The Land Reform Ordinance limits future land acquisitions to 21 acres whilst retaining present ceilings. <i>Benami</i> (ceiling avoiding) transfers to relations are outlawed, but again evasion is easy. Legal recognition to the rights of share-croppers is given for the first time and share-cropping is established as the only admissible form of tenancy contract.
Late 1980s	Only 0.2% of value added in agriculture collected as LDT revenue, of which collection cost is two thirds.
Late 1980s	Muyeed Committee recommends that functions of Land Registration (sub-registrar) and record ( <i>tehsil</i> ) be brought together in a single office at field level but this is ignored.
1988	Cluster village programme resettles landless people on state land, but only 800, with some 32,000 households, have been formed by 1996.
1989	Board of Land Administration split into Land Appeals Board and Land Reforms Board to deal with the ever increasing volume of quasi-judicial appeals.
1991	A survey shows 90% of the rural population are unaware of the 1984 reforms.
1991	A land administration manual lays down detailed instructions regarding inspection and supervision of Union and <i>Thana</i> land offices.
1992	Farms of up to 8.33 acres are exempted from LDT. 8.33 – 10 acres are charged at BDT 0.5 per acre, and larger holdings at BDT 2 per acre.
1997	New Agricultural <i>Khas</i> Land Management and Settlement Policy introduced.
1998	Total <i>khas</i> land is found to be 0.75 million acres (or 3% of arable land area). But the actual amount remains unclear as a result of <i>de facto</i> private control arising from informal local settlements.
2015-20	Estimated date for completion of survey of land rights.

**Table A5: Types of Land Surveys Description**

1	Cadastral Survey(CS)	Conducted from 1888 to 1940 Conducted according to “the Bengal Tenancy Act, 1885” The scale of the map is 16 inches to 1 for mile for provinces, and 32 inches to 1 mile for large cities.
2	State Acquisition Survey (SA)	Conducted from 1956 to 1962 Conducted according to “the State Acquisition and Tenancy Act, 1950”
3	Revisionary Settlement Survey (RS)	Started in 1965 for Dhaka, Rajshahi, Chittagong and Pabna Currently, the results of the RS land survey are managed by DLRS as printed matters, and distributed to local government offices.
4	Bangladesh Survey (BS)	After 1984, the Bangladesh government installed the Zonal Settlement Office to conduct surveys quickly. BS surveys continue to be conducted regularly, and the last BS survey was conducted in 2010.



**Table A6: Remote sensing image-based analysis of major land cover changes (with % change) in all divisions, 1976–2010**

	Major land cover types																			
	Cropland				Forest				River				Rural Settlement				Urban & Industrial			
	1976	2000	2010	Ch%	1976	2000	2010	Ch%	1976	2000	2010	Ch%	1976	2000	2010	Ch%	1976	2000	2010	Ch%
	m. ha	m. ha	m. ha	76-10	m. ha	m. ha	m. ha	76-10	m. ha	m. ha	m. ha	76-10	m. ha	m. ha	m. ha	76-10	m. ha	m. ha	m. ha	76-10
Dhaka	2.31	2.31	2.16	-0.19	0.3	0.13	0.09	-2.04	0.11	0.12	0.11	0.002	0.22	0.35	0.51	3.75	0.01	0.02	0.04	9.40
Chittagong	1.37	1.37	1.19	-0.39	1.38	1.16	1.31	-0.14	0.13	0.14	0.15	0.47	0.16	0.33	0.34	9.48	0.01	0.01	0.02	4.25
Rajshahi	1.55	1.44	1.28	-0.52	0.009	0	0	-2.94	0.04	0.06	0.07	1.769	0.12	0.19	0.26	3.59	0.002	0.002	0.002	2.25
Khulna	1.33	1.32	1.22	-0.21	0.41	0.41	0.40	0.07	0.21	0.20	0.20	-0.08	0.14	0.15	0.15	0.12	0.002	0.003	0.005	6.03
Barisal	0.84	0.82	0.81	-0.10	0.02	0.04	0.02	0	0.35	0.33	0.34	-01.4	0.06	0.09	0.09	1.55	0	0	0.002	12.89
Sylhet	0.95	0.83	0.84	-0.33	0.04	0.01	0.02	-1.24	0.01	0.01	0.01	-0.58	0.09	0.20	0.22	4.08	0.002	0.001	0.007	5.86
Rangpur	1.41	1.35	1.24	-0.53	0.02	0.03	0.03	-2.53	0.04	0.03	0.06	0.75	0.10	0.15	0.20	3.06	0.001	0.004	0.006	10.47

Source: SRDI (2013).