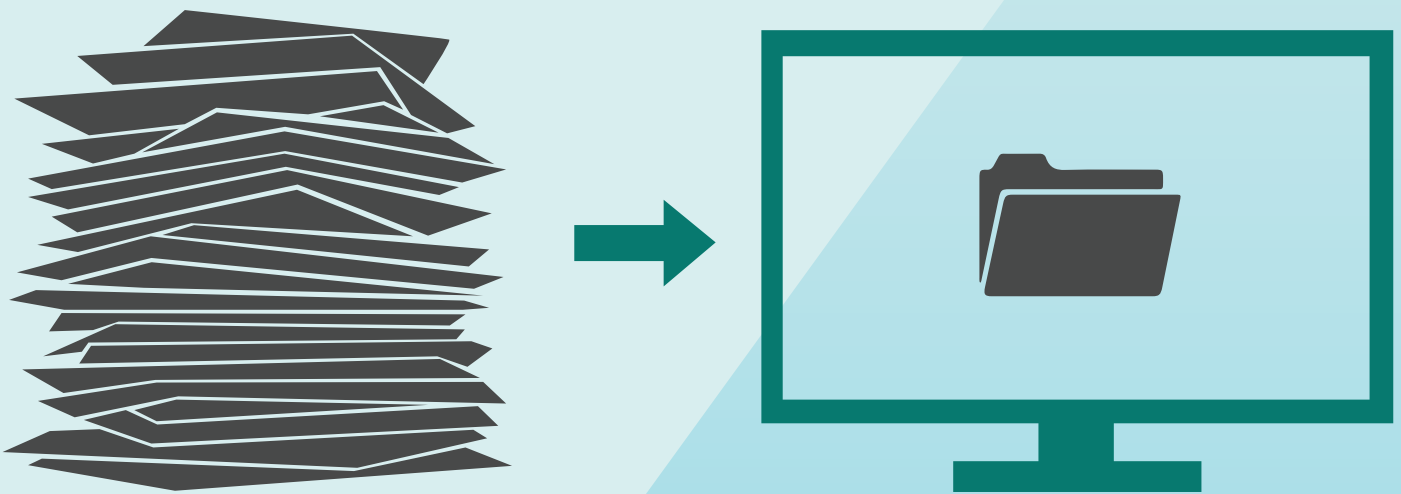


THE COSTS AND BENEFITS OF DIGITIZATION OF LAND RECORDS VIA SIMPLIFIED APPLICATION PROCESS

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Benefits and Costs of Digitizing Land Records in Bangladesh

The Costs and Benefits of Digitization of Land Records via Simplified Application Process

Bangladesh Priorities

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Section 1: Background

Bangladesh is one of the most densely populated countries, where around 1,222 people (World Bank, 2015) live per square kilometre. Bangladeshi's are closely connected to the land for their livelihood, social norms and economic activities. Hence, for the development of Bangladesh, the land administration and management needs an effective system. There are three core functions of land administration in the current system: (i) record keeping, (ii) registration, and (iii) settlement. Various departments of the Ministry of Land (MoL) and the Ministry of Law, Justice and Parliamentary Affairs (MLJP) maintain these three core functions. The discharge of most land-related activities (including land survey, land development tax collection and arbitration process) is governed by MoL and the records of land mutation and transfers by MLJP (Hossain, 2015).

Despite its importance in daily lives and economic activities, the land sector in Bangladesh has been prone to numerous indiscretions and corruption associated with land market transactions and the land administration system, such as – complexity of land ownership and inheritance of land; legal loopholes; flawed land records; poor quality human resources involved in land management and record keeping; and endemic or systematic corruption because of high rent. Due to inconsistency in land records, possession, ownership and property rights documents, high transaction costs prevail in land markets. Due to the exponential increase in the value of land as a result of population growth, industrialisation and the growth of a commercial economy, land transactions became important and the evolution of a well functioning land market have come to the forefront.

For the above reasons, land transaction is problematic, inefficient and severely constrained in the competitive land markets. With the intent to overcome the associated problems, the government has taken various policy measures to reform and restructure land administration and its services over the years. The expectation was that the land would be managed properly and services would be delivered in an efficient manner. In January 2010, the Bangladesh government has engaged in a process of digitising the land record system via public-private partnership (PPP). This was a strategy to improve efficiency and to reduce the corruption of land related problems. It is expected to save the government 6.99bn Tk (Mahmud, 2013). The intention was to computerise existing records and update records based on digital surveys. This was also expected to reduce fraud and litigation in connection with land ownership.

In this paper, the cost and benefit of digitisation of land records, via simplified (electronic) application process, has been analysed. Section 2 of the paper exhibits the Economic Importance of Land Records; Section 3 explains the History of Land records; Section 4 observes the Present Maintenance and

Situation of Land Survey and Land Transfer Records; Section 5: elaborates the Methodology of the study; Section 6 describes the case study of Digitisation of the System of Savar Land Office; Section 7 emphasizes the Assumptions for the study; Section 8: Analysis shows the breakdown of status quo costs and the cost benefit analysis of the intervention; and Section 9 provides a short Conclusion of the study.

Section 2: Economic Importance of Land Records

In a competitive market, the derived demand for the creation of land determines the demand for land (Seth). So, if the demand of the produced products, e.g. rice, increases then the demand for the use of agricultural land will increase; this will ultimately increase the rent of the land, and vice-versa. Thus, the rent of the land will depend on marginal productivity of land, which is conditional on the law of diminishing marginal productivity. Even though land can be increased or decreased for an individual or a particular industry, for a society, the supply of land is fixed. So, the rent does not have an effect on the supply of the land as the supply of land is inelastic. Hence, the rent of land in a competitive land market depends on the demand for land, which means the marginal productivity of land, for a fixed supply of land. If the quality of all land (for production) is homogenous then there will be only one demand curve, so one equilibrium. However, in reality, the quality of land differs and therefore there is differential rent for land. To maximise the rent of land, the above competitive market is essential. Without a proper classification and record of land, the land market cannot be competitive and the rent will not be maximised. Therefore, there will be a dead-weight loss and revenue will be lost.

Land records are important as it helps to improve the security of property rights by for example, reducing the risk of expropriation. According to De Soto, secure property rights are one of the keys to a country's development. There is evidence, albeit not definitive, that secure property rights also have an influence on long-run economic growth (see Locke, 2013 for a review of the relevant literature). For this paper we refer to the work of Knack and Keefer (1995) who identify five factors that lead to increased economic growth, one of which is related to secure property rights. Their five factors are derived from the International Country Risk Guide. They are:

1. Quality of Bureaucracy
2. Corruption in Government
3. Rule of Law
4. Expropriation Risk
5. Repudiation of Contracts by Government

These five factors form a scale allowing comparison of the strength of governance and institutions across countries. Knack and Keefer (1995) find that a 1 standard deviation of movement on this scale – at the time of their study - the difference between Honduras and Costa Rica leads to 1.2 percentage points of growth per year. We use this relationship to estimate the economic benefits from land digitisation in Section 5 below.

Section 3: History of Land records

Section 3.1: Survey, Record Keeping and Mutation

Under the 'Survey Act, 1875', British colonial rulers conducted 'The Cadastral Survey' (CS) from 1888 to 1940. This survey prepared the Records of Right (ROR/ *Khatian*), where the name of the owners (then *Zamidaar* (feudal lords/land owners), occupants, narrative of land, amount of revenue and all the other exacting facts of lands are described. The record copies were conserved in the district record room and *Zamidaars'* tax office. Later, under 'The East Bengal States Acquisition and Tenancy Act, 1950', the *Zamidaari* system was abolished. By this act and mutation of land records for tenants were effectively provisioned and a short survey, namely, 'State Acquisition' (SA) was conducted from 1956-1962. This survey followed the CS blueprint and the records were handwritten similar to CS records. These handwritten SA record copies were stored in the district record room, *Thana* Revenue Offices, and *Tahsil* (Union Land) offices. Mutation was done by re-writing in the *Khatians*.

After 50 years of SA survey, the Revisional Survey (RS) of land was conducted after independence in 1971. The latest survey of land known as 'Bangladesh Survey (BS)' was followed after the 'City Survey' in Dhaka City. The BS started in 2010 and is an on-going survey. These surveys now have printed copies and are preserved in the Deputy Commissioners' record room, Upazila Land Office and Union Land Office.

Section 3.2: Registration of Land

The idea of registration of land ownership first came up when the 'Transfer of Property Act, 1882' was effective. This act sanctioned the transfer of land for both the present and the future. Later, 'The Registration Act, 1908' was introduced to establish land registers and collect 'ad valorem' based on registration fees, different transfer related taxes. The registration records are stored in registers at sub-registrar's office.

Section 4: Present Maintenance and Situation of Land Survey and Land Transfer Records

The updated land records verified by the land survey are retained by the three Land officials – Directorate General of Land Records and Survey, Deputy Commissioner/ Collector of Land and Local Revenue Collector of Land office. The Assistant Commissioner (AC) of Land is in charge of the Land offices.

The transfer of Land is handled by the Sub-Registrar of Office, under the MLJP. The land transactions need to be registered within a month in this office. After the registration of land, the mutation of land records needs to be completed in AC Land Office.

Mutation is the process through which land amendments, temporary changes, corrections and updating of land records are documented in the ROR or *Khatian*. Mutation of lands usually requires huge documentation. It is applied for by the following kinds of owners –

- Successors of a deceased person
- Owner by a transfer of property by sale-purchase. In this case there should be a notification of transfer by sub-registrar office provided to AC land
- Owners through will, mortgage, lease, exchange, and auction
- Decrees of courts and settlement by the government (Islam, 2013)

Section 4.1: Relevant Officials and their responsibilities

The land survey is maintained by the Directorate General (DG). The steps of land survey that are monitored by DG are –

1. Survey (kistwar) and mapping
2. Preliminary record (khanapuri)
3. Local explanation (bujharati)
4. Attestation (tasdik)
5. Draft publication of Khatian by Surveyor

The Deputy Commissioner (DC) of every district principally manages the following sections of land (Islam, 2013) –

1. Revenue
2. Land Acquisition (LA)
3. Record room

4. Vested Property

The Upazila Land office governed by the Assistant Commissioner (AC) of Land is also in charge of Union Land Office. The main responsibilities of AC Land are –

- Revising the land records through mutation and verifying the records for mutation
- Implementing the acts and rules regarding land
- Supervising the Union Land Office
- Monitoring all the functions related to government (*Khas*) Land
- Reporting about land updates to Deputy Commissioner

Union Land Office performs several activities related to land. The main activities are –

- Investigating land information for mutation and reporting to AC Land
- Updating the records according to the order of the mutation cases
- Determining and collecting Land Development Tax (*Khajna*)

The responsibility of sub-registrar of every Upazila is usually to register the transfer of properties (land), however it falls under MLJP. The major duties of this office is to –

- Register the land transfer
- Valuation of the land property of the associated region

The proper management of the land related issues can be ensured if there is an appropriate coherence among the officials.

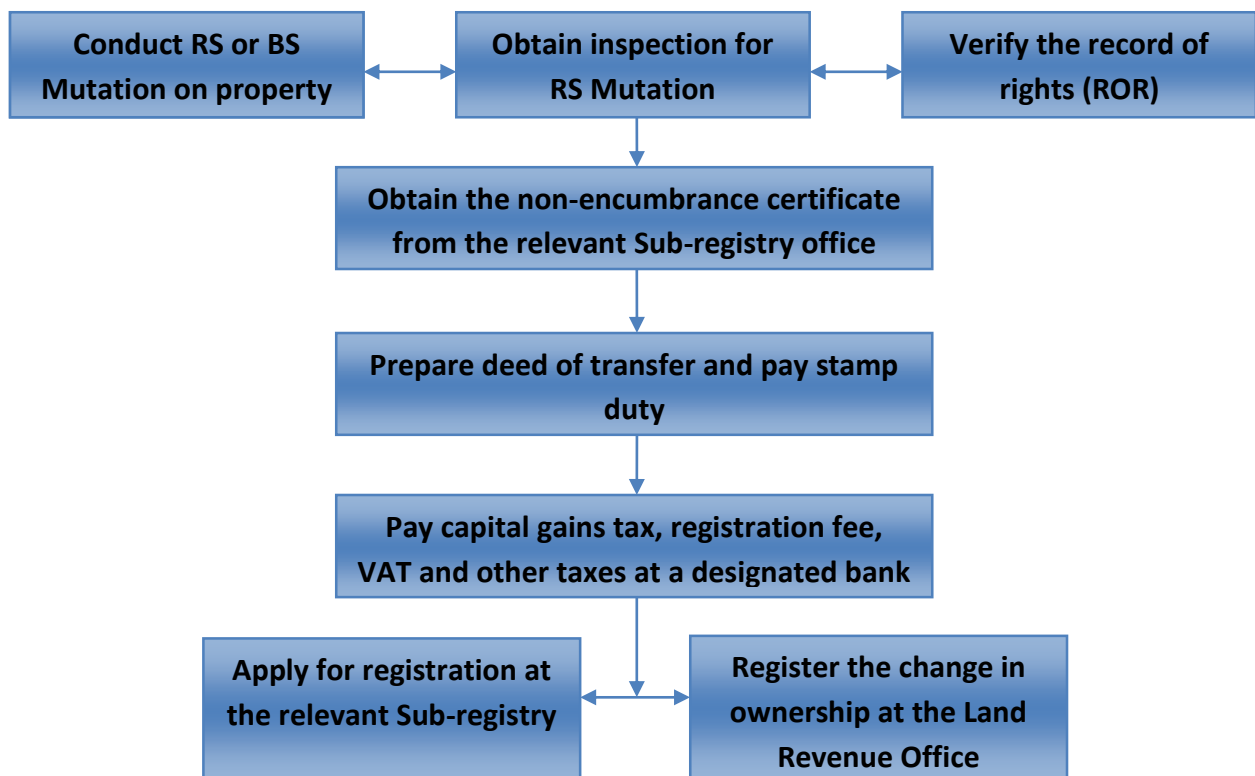
Section 4.2: Status Quo of Land Record System

In the Seventh Five Year Plan of Bangladesh, Land Administration is given added importance due to its failure to provide effective service. The current land administration and management still follow the ancient system set by during British Colonial rule, starting from the survey to collecting land development tax. Usually the land survey should take place after every 5 years, but the report of new surveys can be delayed by 10-15 years, as a result the reports are severely out of date. The survey information changes due to transfer of land within this time, so the new BS/City survey needs to be updated regularly if possible. These survey records are then stored in the land office, where the mutation of land are also done. The Land records can be updated by survey and mutation. Then the new records are documented in the register. The registers have designated numbers, such as, No-1 register is for Government owned land, No-2 is for Forest land, etc.

The present system of land recording in the local land management and registration offices follow the age-old system of writing down a great deal of details on how specific land ownership titles were handed down through generations, changed hands, current ownership, heirs on both side (buyer and seller) of the families, the specific land area owned on each ‘parcel’ or ‘daag’, in an archaic customary language, which is incomprehensible to most ‘lay’ readers. The land record and registration offices are not well managed; documents and archives are damaged and frail due to poor storage facilities.

The officials who are responsible for creating and maintaining land records often prepare incorrect records which generate an access barrier for genuine land owners. Therefore a rent is generated and captured by the land officials. This creates opportunity costs for both the buyer and the seller side of land. Moreover, the landowners have to make multiple visits to the land offices to get their work completed. Because of the incentives of high rent seeking, the status quo is preferably maintained by the officials. The steps of current land transaction are shown in the following flow-chart –

Flow-chart 1: Steps of Land Transaction



Section 4.3: Initiative taken by government

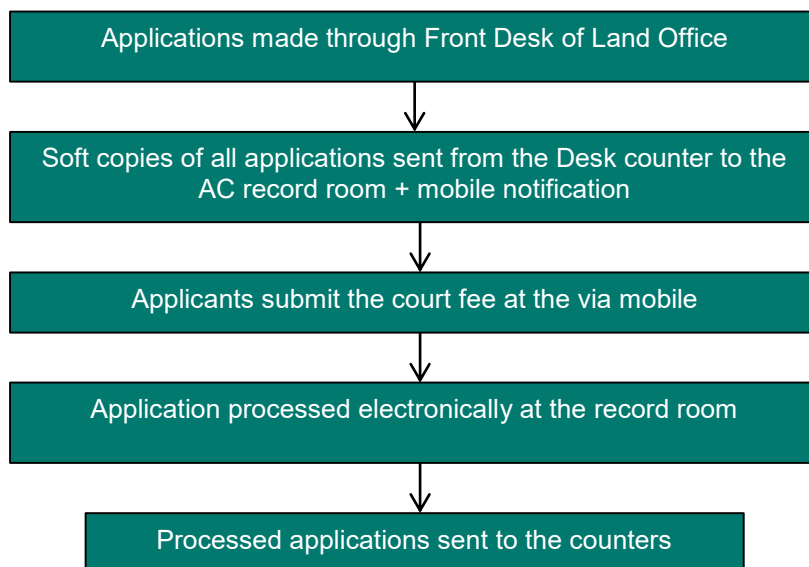
The recent scheme taken by the Government of Bangladesh intends to digitise the land records, integration of AC land and Sub-registry offices, e-filing requesting *Khatian* (RoR) from District Record Room and scanning of tattered *Khatian* and maps. This intervention is expected to not only save in

government expenditure but also to reduce fraud and litigation in connection with land ownership. Access to Information (A2I) has been given the responsibility by the Prime Minister’s office to digitise the land sector. Some AC Lands of various Upazilas have also taken the initiative to digitise the land administration system. The implemented projects are –

- The digitisation projects are being implemented in six Upazilas under two different technologies, digitalization of land records and integration of AC land and Sub-registry offices in 45 upazillas of 7 districts, e-filing requesting *Khatian* (RoR) from District Record Room and scanning of tattered *Khatian* and maps.
- In Savar Upazilla, for 4 *mauzas*, digital piloting program has been completed. Savar Land office has digitised their system (Office Automation System) to improve official performance (linking sub-register office with land office) and ease the civil service (e-filing for mutation or requesting of RoR).

A2I has started an application simplification service for *Porcha* (ROR), known as ‘Electronic-*Porcha* Delivery System’, which also helps to update the land records. The digitise process is shown in the following chart (Access to Information, 2014)–

Flow-chart 2: Application process of E-*Porcha*



Section 5: Methodology

The focus of this study is to analyse the costs and benefits of digitising land records via a simplified application process. Savar Upazila Land Office is taken as a case of digitisation via electronic

application process, which is similar to the E-Porcha system of A2I. The costs of this digitisation are further scaled up for the 483 upazilas of Bangladesh. The benefit of the intervention is measured both from the information based on the A2I's TCV reports and Savar case study.

At the outset, the study looked into the associated cost with land transaction to get an idea of the existing state without digitisation. This is to justify the digitisation of the land system. The costs involved in land transaction without digitisation on top of the property value are –

- Administration Cost
- Transaction cost
- Travel costs (Mutation)
- Opportunity costs (Mutation)

The implementation of digital record system involves costs. These are mainly the setting up cost of server, maintenance cost, internet cost, training costs of the staff at the implementing agencies and labour cost of implementing the digital record system. There will also be a system analyst cost for the digitisation. Some of the costs will accrue only once or over a few more periods. For example, setting up the server is a one-time investment whereas training, given the size of the public sector work force, might take a few years. We will estimate the time and cost of the trainings. There are some costs that will incur every period over the lifetime, such as, maintenance costs. However, this study accounts for the following costs –

- Development Cost
 - Software Cost
 - New Computers
 - Other Start-up cost
 - Scanning/digitising the land records
- Operating Cost
 - System analyst salary
 - Internet Cost
 - SMS notification

The digitisation of land records improves the land transaction and land administration. Firstly, the digitisation makes it easy to acquire information of land as it will be publicly available, resulting in reducing the cost of getting the land information. As a result, frequent visits to the land office will reduce. This will reduce the travel cost and opportunity cost of visiting the land office. Secondly, the physical manipulation of land records will be reduced. This will also lead to fewer land related cases

and reduce government-legislated rent seeking behaviour of the officials. Third, some of the steps of the procedure will decline, so the transaction costs from those services will decrease as well. Finally, digitisation may also help in securing property rights. In this study, due to research limitations, the benefits that are looked into are –

- Annual cost savings from time and visit to land offices
- Opportunity cost savings of *Porcha* requestors for visiting the land office
- Government Saving on printing/storage annually
- Economic benefit from slightly improved and secured property rights

The economy benefit from secure property rights are calculated by using the results of Knack and Keefer (1995). Land digitisation could make some improvement in expropriation risk and rule of law. For this analysis we assume land digitisation will affect 1/10th, 1/20th or 1/30th of one of the five factors in the Knack and Keefer framework, leading to and 1/50th, 1/100th or 1/150th standard deviation movement on the ICGR scale. This corresponds to a 0.024, 0.012 or 0.008 percentage point boost to growth.

The costs (digitisation and in status quo) and benefits stream of digitisation will be for lifetime. So, the benefit to cost ratio the intervention will be calculated using the following formulae:

$$BCR = \frac{PV_B}{PV_C}$$

Where BCR is the benefit-cost ratio, PV_B is the present value of benefit, and PV_C is the present value of cost. As the costs (excluding start-up costs) and benefits will be for lifetime, they will follow the present value for perpetuity –

$$PV_{B,C} = \frac{B,C}{i}$$

Where B is future benefit; C is future cost and *i* is the discount rate. The discount rates (3%, 5% and 10%) are prescribed by Copenhagen Consensus Center.

This study employed various approaches to collect information to execute the cost benefit analysis. The approaches that are used are – key informant interviews (KII), focus group discussions (FGD) and official data collection from MoL and Transparency International Bangladesh (TIB). In total, twenty KIIs and FGDs were conducted – five KIIs with real estate agents, two KIIs with AC Lands, one KII with one advocate, two KIIs with Access to Information (A2I) officials and the FGDs were conducted on the users of the services.

Section 6: Digitisation of the system of Savar Land Office

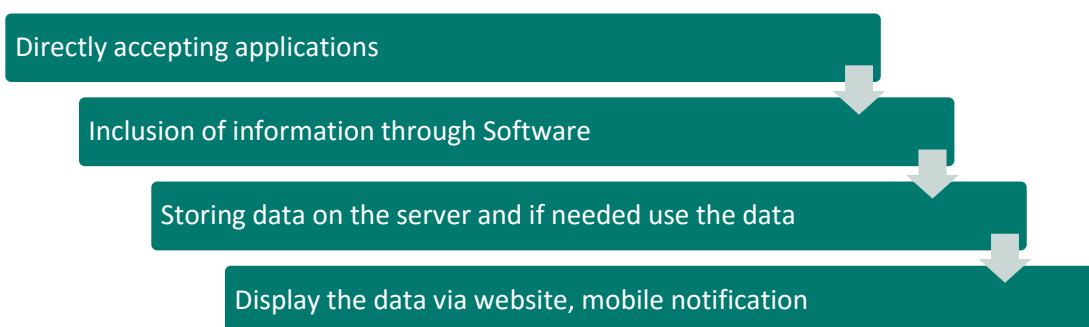
Savar AC land has taken the initiative to digitise the land administration system. Office Automation System is the software used by Savar AC Land office to improve official performance and ease the civil service in a unique way. The purpose of the software is to finish the land office work in a quick, easy and accurate manner, which makes the land management as well as other official matters simple and automatic. The software was inspired by the National e-service system or NESS, and the procedure is also similar to NESS; 50% of the system has been completed. With this software, currently the following work is being done:

- Mutation / *Jomakharij* (sub-division) / consolidation
- Miss-case (currently only review clerical correction which is under section 150) regarding activities are being performed
- Various SMS notification sent to users
- Automatic digital archiving of documents
- Immediate signatures of AC land where approved
- Immediate copies of documents
- The Land Development Tax notice and mutation information are directly passed online to the Assistant Commissioner (Land) by the Sub-Registrar. According to the AC Land Savar, the government can save 5-10 thousand BDT per month on documentation.
- Finding out the latest update of the applications from any mobile phone and websites via SMS
- Preparing different registers (register I, II, IX (Part III), XIII, etc.
- Monitoring of land offices by the higher authority

Section 6.1: Application for Mutation

This process is done at the front desk of the Land office by computer operators, who are support staff at the office. The application process is given below-

Flow-chart 3: Application of Mutation at Savar



After the submission of the application, applicants are notified about all the process associated dates via SMS, if needed, applicants can also check the progress via SMS. Even though, any applicant can submit applications themselves, in truth, everyone has to submit through middlemen or agents.

Section 6.2: Mutation Automation

The system has a different interface for different officials. AC (Land) and each assistant have been assigned to do their particular work in their respective interfaces. After receiving the mutation application, the next activities are –

- The initial authorization of the application by AC (Land)
- Concerned ULAO submits an investigation report on the land
- If the report is positive from ULAO, then the date of hearing is announced
- Kanungo / Surveyor or Sub-assistant officer to the report
- If each steps is verified, one can submit an recommendation for mutation to the AC Land
- After collection of fees via DCR, applicants will be supplied the ledger. These DCRs copies are being stored by the system as well.

If the concerned ledger of application is entered in the database from before, then it can be selected; otherwise at the time of the new application, it should be added. Because of a shortage of employees, old land records are not computerised. Only the current mutations and its relevant ledgers are being computerised and digitised. In the case of more than one owner, several concerned *daags*, comments, any kind of land-classification –everything can be updated in this system.

According to the AC Land, the mutation process is done within 28 days, whether they approve or deny the application. For this process, the user has to be present for 4 days.

Section 7: Assumptions

The assumptions related to the analysis are –

- From FGD at Savar and Aminbazar, on average one spends 5 days for mutation and 50 TK for travel.
- Value of time for the average worker in Bangladesh is 7307 BDT/month (assumption of Copenhagen Consensus Center), so hourly value of time is 43.667 BDT.
- Based on the FGDs a person spends on average of 4 hours a day at land office.
- The average of the transaction costs of status quo are taken from TIB report 2015.
- The real growth rate for 50 years is taken as 4 %.

- The costs, excluding the development cost (which is a one-off cost), will be incurred over lifetime and so will be the benefit.
 - Cost of digitisation: The set up cost or development cost of the system is one off, so only on the base year it is accounted. In the government office the operating costs (salary, internet cost, and SMS notification) are not changed frequently. So, the operating cost will be the lifetime cost of infinity years.
 - Benefit of digitisation: There are two types of benefits of the digitisation; one is the financial benefit and another is the economic benefit.

Section 8: Analysis

The total cost of land transaction over the property value of land (especially for mutation) comes to almost 52 billion BDT (approx.) in the base year 2015 (shown in Appendix). As the status quo will have perpetuity cost, the lifetime cost will mount up to approximately 1,743 billion BDT at 3% discount rate, 1,046 billion BDT at 5% discount rate, and 523 billion BDT at 10% discount rate.

We calculate the benefits from time, cost and storage savings as well as economic benefit. While there is a reasonable body of evidence that secure property rights lead to increased growth, there are also critics who question among other things, whether property rights are the primary driver of growth (Schmid, 2006), if the property rights–growth relationship is causal rather than correlative (Chong and Calderon, 2000) and whether results are robust to data selection and different measures of property rights (Radeny and Bulte, 2011; Chang 2005). For these reasons we present results with and without the economic benefit derived from Knack and Keefer (1995). See table below ¹ –

Table 1: Benefit-Cost Ratio

PRESENT VALUE DISCOUNT RATE	3%	5%	10%
BCR (WITH NO ECONOMY BENEFIT)	3.90	3.49	2.76
BCR (WITH 0.024 PERCENTAGE POINT BOOST IN GROWTH P.A.)	1868.19	1340.84	483.23
BCR (WITH 0.012 PERCENTAGE POINT BOOST IN GROWTH P.A.)	873.23	619.27	212.95
BCR (WITH 0.008 PERCENTAGE POINT BOOST IN GROWTH P.A.)	583.05	279.25	63.36

The above table shows, that when there is no other economic benefit from digitisation, every one BDT spent on digitisation would give a benefit of BDT 3.90 at low (3%) discount rate, BDT 3.49 at medium (5%) discount rate and BDT 2.76 at high (10%) discount rate. Clearly digitisation of land record via simplified application process would offer an overall national gain in the form of time and cost savings.

¹ The details in Appendix – 6

However, if the economic benefit from secured property rights is considered then the benefit will be immensely higher. We calculated the economic benefit using the Knack and Keefer relationship, and assuming 1/50th S.D. improvement in the ICGR scale (0.024 percentage point) the benefit cost ratio is an enormous 1341 at the 5% discount level. Using assumptions of 1/100th S.D. movement (0.012%) times or 1/150th S.D. movement (0.008%) do not change the impressiveness of the benefit-cost ratios.

Some caution is required when assessing these economic wide results. Digitisation of mutation records alone will not establish secure property rights in Bangladesh. Firstly, clear and accurate records from cadastral surveys of land by *mouza* need to be digitised and made transparent and accessible to the public. This will clarify the location, size and shape of land plots and the 'proof' of their existence. Second, the registered deed of land transactions/inherited ownership needs to be digitised. This will provide an efficient and transparent basis for authentication of ownership/inheritance including the history of all previous transactions. Finally the digitisation of mutation records will provide transparency and efficiency in authenticating ownership. The three crucial records together will establish secure ownership and freer market for land.

Only digitising the records is unlikely to fully secure property rights. Moreover, the substantial changes in inheritance laws and the parallel use of Roman and Islamic inheritance laws, apart from governance and political economy factors, may mute the property rights benefits from land digitisation.

Section 8.1: Limitations

There are some limitations associated with this study. The major challenges are –

- Given the timeframe, the study could not directly estimate the time-saving benefit as this requires a survey. Instead time savings were modelled using information provided in KIIs.
- The breakdown of cost savings at every stage was not possible to figure out.
- A huge part of land cost comes from land disputes and after digitisation the disputes will reduce. However, quantifying and monetizing the reduction of court cases based on the digitization and monetising the cost of disputes is not possible as it varies from case to case.

Section 9: Conclusion

Bangladesh is highly dependent on land, hence clean land records are very crucial. Because of inconsistencies between land records and settlements, land owners often encounter conflict. Even though digitising the land records is not the only initiative that can solve the land problem, as current land records might also be incorrect, it is the start of resolving land issues. Looking ahead, once digitisation of land records: accurate cadastral survey records of land holding and public lands, land

transaction and registration records, as well as land mutation records are completed and synchronized, as well as be simultaneously accessible at the three nodal offices, i.e., Land Registration, Assistant Commissioner of Lands, and the Deputy Commissioner of the district along with access of relevant data fields to the public, land ownership, tenurial rights and transactions will be fully secure based on the rule of law. This may need to be supplemented by further legal reform. Significantly, such digitization, rights backed by quicker dispensation of land cases/disputes, will make it easier to enforce contracts, paving the way for rapid development of a modern land market--a binding constraint to wealth generation, GDP growth and steeper decline in poverty. The full economic benefits and welfare gains of these actions and reforms would be incalculable.

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Appendix

Appendix 1 – Costs (Status Quo) Sources

Costs	Components	Source
Travel costs (Mutation)		KII+FGD Saver
Opportunity costs (Mutation)		
Transaction Cost	Hearing fixing day	TIB 2015
	Mutation	
	Withdrawal of Certified Copies of Records and Maps	
	Corrections of Records under Tenancy Rules 30 & 31	
	Bribery at Different Stages of Land Disputes	

Appendix 2 – Costs (Intervention) Sources

Different Costs		Source
Development Cost	Software Cost	KII with Savar AC Land
	New Computers	
	Other Start-up cost	
Operating Cost	Salary	Ministry of Land
	Internet Cost	KII with Savar AC Land
	SMS notification	

Appendix 3 – Benefits Sources

Different Benefits	Source
Cost savings	Access to Information (A2I)
Opportunity cost savings of visiting the land office	Estimated based on the CCC's assumption and A2I
Government Saving on storage per month	KII with Savar AC Land
Economy Benefit	Knack and Keefer (1995)

Appendix 4 – Assumptions

Issues		Comment
District	64	
Upazillas (Intervention)	483	
Working Days 2015	251	
Months in a year	12	
Average Working Days in a month	21	
Average Working Hours/day	8	
Working Hours in a month	167	
Working hours in a year	2008	
Value of time for average worker BDT/month	7307	
Hourly wage on average (BDT)	43.67	
Hours spent for Porcha each day	4	
USD to BDT (Exchange rate)	77.63	
Cost Saving Annually (BDT)	256179000	
Monthly Porcha requested	40000	
Annual Porcha requested	480000	
Savings per Porcha/Records	534	
Real Growth Rate	3%	
Benefit from secure property rights	0.02%	Assumes 1/50th movement on Knack and Keefer Governance Scale
Total Land Records in Bangladesh	50000000	

Appendix 5 – Status-Quo Cost Side

Status-Quo Cost Side			
Different Costs		Days	Annual (2015)
Transaction cost			51,768,000,000
Mutation Transaction costs	101,500		48,720,000,000
Hearing fixing day	600		288,000,000
Withdrawal of Certified Copies of Records and Maps	600		288,000,000
Corrections of Records under Tenancy Rules 30 & 31	4,500		2,160,000,000
Bribery at Different Stages of Land Disputes	650		312,000,000
Travel costs (Mutation)	250	5	120,000,000
Opportunity costs (Mutation)	873	5	419,206,375
Total costs	108,973		52,307,206,375
Present Value Discount Rate	3%	5%	10%
Cost (BDT in millions)	1,743,574	1,046,144	523,072

Appendix 6 – Cost Benefit Analysis of Digitization

Digitization			
Different Costs	Price (in BDT) Savar		Year 2015
Development Cost (One-off cost)			732110000
Software Cost	40000		19320000
New Computers	120000		57960000
Other start-up cost	10000		4830000
Scanning/ Digitising the records	13	Per record digitising	650000000
Operating Cost			101512800
Salary	15600		90417600
Internet Cost	21600		10432800
SMS notification	1.38		662400
Total Cost (without Development Cost)			101,512,800
Different Benefits	Price (in BDT)	Day Saving	Year 2015
Cost savings			256,179,000
Opportunity cost savings of visiting the land office	349.34	2	167,682,550
Government Saving on printing/storage per month	10000		57,960,000
Private Benefit			481,821,550
Present Value Discount Rate	3%	5%	10%
Cost (BDT in millions)	4,116	2,762	1,747
Private Benefit (BDT in millions)	16,061	9,636	4,818
BCR (with no economy benefit)	3.90	3.49	2.76
Economy benefits (BDT in millions) (with 1/50 growth)	7,673,147	3,694,252	839,502
BCR (with 1/50 growth)	1,868.185	1,340.839	483.231
Economy benefits (BDT in millions) (with 1/100 growth)	3,578,029	1,701,002	367,251
BCR (with 1/100 growth)	873.227	619.265	212.947
Economy benefits (BDT in millions) (with 1/150 growth)	2,383,694	1,133,279	244,718
BCR (with 1/150 growth)	583.049	279.246	63.359

Appendix 7 – Economy Benefit, with the assumption of 1/50th movement on Knack and Keefer Governance Scale

Year	GDP - base, BDT millions	GDP - boosted, BDT millions	Benefit, BDT millions
2015	15,366,999	15,366,999	-
2016	15,828,009	15,831,697	3,688
2017	16,302,849	16,310,448	7,598
2018	16,791,935	16,803,676	11,741
2019	17,295,693	17,311,819	16,126
2020	17,814,564	17,835,328	20,765
2021	18,349,001	18,374,669	25,668
2022	18,899,471	18,930,319	30,848
2023	19,466,455	19,502,771	36,317
2024	20,050,448	20,092,535	42,087
2025	20,651,962	20,700,133	48,172
2026	21,271,521	21,326,106	54,585
2027	21,909,666	21,971,007	61,341
2028	22,566,956	22,635,410	68,454
2029	23,243,965	23,319,905	75,940
2030	23,941,284	24,025,099	83,815
2031	24,659,523	24,751,618	92,095
2032	25,399,308	25,500,107	100,799
2033	26,161,287	26,271,230	109,943
2034	26,946,126	27,065,672	119,546
2035	27,754,510	27,884,138	129,628
2036	28,587,145	28,727,354	140,209
2037	29,444,760	29,596,070	151,310
2038	30,328,102	30,491,055	162,952
2039	31,237,945	31,413,104	175,159
2040	32,175,084	32,363,036	187,953
2041	33,140,336	33,341,695	201,358
2042	34,134,546	34,349,948	215,401
2043	35,158,583	35,388,690	230,107
2044	36,213,340	36,458,844	245,504
2045	37,299,740	37,561,359	261,619
2046	38,418,733	38,697,215	278,482
2047	39,571,295	39,867,419	296,124
2048	40,758,433	41,073,009	314,576
2049	41,981,186	42,315,057	333,871
2050	43,240,622	43,594,665	354,042
2051	44,537,841	44,912,967	375,126
2052	45,873,976	46,271,135	397,159
2053	47,250,195	47,670,374	420,179
2054	48,667,701	49,111,927	444,225
2055	50,127,732	50,597,071	469,339
2056	51,631,564	52,127,127	495,563
2057	53,180,511	53,703,451	522,940
2058	54,775,926	55,327,443	551,517
2059	56,419,204	57,000,545	581,341
2060	58,111,780	58,724,242	612,461
2061	59,855,134	60,500,063	644,929
2062	61,650,788	62,329,585	678,797
2063	63,500,311	64,214,431	714,120
2064	65,405,321	66,156,276	750,955

2065	67,367,480	68,156,841	789,361
2066	69,388,505	70,217,904	829,400
2067	71,470,160	72,341,294	871,134
2068	73,614,265	74,528,894	914,630
2069	75,822,693	76,782,648	959,956
2070	78,097,373	79,104,556	1,007,182

Appendix 8 – Economy Benefit, with the assumption of 1/100th movement on Knack and Keefer Governance Scale

Year	GDP - base, BDT millions	GDP - boosted, BDT millions	Benefit, BDT millions
2015	15,366,999	15,366,999	-
2016	15,828,009	15,829,853	1,844
2017	16,302,849	16,306,648	3,799
2018	16,791,935	16,797,805	5,870
2019	17,295,693	17,303,755	8,062
2020	17,814,564	17,824,944	10,380
2021	18,349,001	18,361,831	12,830
2022	18,899,471	18,914,889	15,419
2023	19,466,455	19,484,606	18,151
2024	20,050,448	20,071,482	21,034
2025	20,651,962	20,676,035	24,073
2026	21,271,521	21,298,797	27,276
2027	21,909,666	21,940,317	30,651
2028	22,566,956	22,601,159	34,203
2029	23,243,965	23,281,906	37,941
2030	23,941,284	23,983,157	41,873
2031	24,659,523	24,705,530	46,007
2032	25,399,308	25,449,661	50,352
2033	26,161,287	26,216,204	54,917
2034	26,946,126	27,005,836	59,710
2035	27,754,510	27,819,252	64,742
2036	28,587,145	28,657,168	70,023
2037	29,444,760	29,520,322	75,562
2038	30,328,102	30,409,474	81,372
2039	31,237,945	31,325,407	87,462
2040	32,175,084	32,268,929	93,845
2041	33,140,336	33,240,869	100,533
2042	34,134,546	34,242,084	107,537
2043	35,158,583	35,273,455	114,873
2044	36,213,340	36,335,892	122,552
2045	37,299,740	37,430,329	130,588
2046	38,418,733	38,557,730	138,998
2047	39,571,295	39,719,089	147,795
2048	40,758,433	40,915,428	156,995
2049	41,981,186	42,147,801	166,614
2050	43,240,622	43,417,293	176,671
2051	44,537,841	44,725,022	187,181
2052	45,873,976	46,072,139	198,163
2053	47,250,195	47,459,832	209,637
2054	48,667,701	48,889,322	221,621
2055	50,127,732	50,361,869	234,136
2056	51,631,564	51,878,768	247,204

2057	53,180,511	53,441,357	260,846
2058	54,775,926	55,051,010	275,084
2059	56,419,204	56,709,147	289,943
2060	58,111,780	58,417,226	305,446
2061	59,855,134	60,176,753	321,619
2062	61,650,788	61,989,277	338,489
2063	63,500,311	63,856,394	356,083
2064	65,405,321	65,779,748	374,428
2065	67,367,480	67,761,034	393,554
2066	69,388,505	69,801,997	413,492
2067	71,470,160	71,904,433	434,273
2068	73,614,265	74,070,194	455,930
2069	75,822,693	76,301,189	478,496
2070	78,097,373	78,599,381	502,007

Appendix 9 – Economy Benefit, with the assumption of 1/150th movement on Knack and Keefer Governance Scale

Year	GDP - base, BDT millions	GDP - boosted, BDT millions	Benefit, BDT millions
2015	15,366,999	15,366,999	-
2016	15,981,679	15,981,679	-
2017	16,620,946	16,620,946	-
2018	17,285,784	17,287,114	1,330
2019	17,977,216	17,979,981	2,766
2020	18,696,304	18,700,619	4,315
2021	19,444,156	19,450,140	5,984
2022	20,221,923	20,229,701	7,779
2023	21,030,800	21,040,508	9,708
2024	21,872,031	21,883,811	11,780
2025	22,746,913	22,760,915	14,002
2026	23,656,789	23,673,172	16,383
2027	24,603,061	24,621,993	18,932
2028	25,587,183	25,608,842	21,659
2029	26,610,671	26,635,245	24,574
2030	27,675,097	27,702,785	27,688
2031	28,782,101	28,813,113	31,012
2032	29,933,385	29,967,942	34,557
2033	31,130,721	31,169,058	38,337
2034	32,375,950	32,418,313	42,364
2035	33,670,988	33,717,639	46,652
2036	35,017,827	35,069,042	51,215
2037	36,418,540	36,474,610	56,069
2038	37,875,282	37,936,512	61,230
2039	39,390,293	39,457,007	66,714
2040	40,965,905	41,038,444	72,539
2041	42,604,541	42,683,265	78,724
2042	44,308,723	44,394,010	85,288
2043	46,081,072	46,173,322	92,251
2044	47,924,314	48,023,949	99,635
2045	49,841,287	49,948,749	107,462
2046	51,834,938	51,950,695	115,756
2047	53,908,336	54,032,879	124,543
2048	56,064,669	56,198,516	133,847

2049	58,307,256	58,450,953	143,697
2050	60,639,546	60,793,667	154,121
2051	63,065,128	63,230,277	165,149
2052	65,587,733	65,764,547	176,813
2053	68,211,243	68,400,390	189,147
2054	70,939,692	71,141,878	202,185
2055	73,777,280	73,993,244	215,964
2056	76,728,371	76,958,893	230,522
2057	79,797,506	80,043,406	245,899
2058	82,989,406	83,251,545	262,139
2059	86,308,983	86,588,267	279,285
2060	89,761,342	90,058,725	297,383
2061	93,351,796	93,668,279	316,483
2062	97,085,868	97,422,503	336,636
2063	100,969,302	101,327,197	357,895
2064	105,008,074	105,388,391	380,317
2065	109,208,397	109,612,358	403,961
2066	113,576,733	114,005,621	428,888
2067	118,119,803	118,574,967	455,164
2068	122,844,595	123,327,451	482,857
2069	127,758,378	128,270,416	512,037
2070	132,868,714	133,411,494	542,780

Bangladesh, like most nations, faces a large number of challenges. What should be the top priorities for policy makers, international donors, NGOs and businesses? With limited resources and time, it is crucial that focus is informed by what will do the most good for each taka spent. The Bangladesh Priorities project, a collaboration between Copenhagen Consensus and BRAC, works with stakeholders across Bangladesh to find, analyze, rank and disseminate the best solutions for the country. We engage Bangladeshis from all parts of society, through readers of newspapers, along with NGOs, decision makers, sector experts and businesses to propose the best solutions. We have commissioned some of the best economists from Bangladesh and the world to calculate the social, environmental and economic costs and benefits of these proposals. This research will help set priorities for the country through a nationwide conversation about what the smart - and not-so-smart - solutions are for Bangladesh's future.

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