8th Five Year Plan
Background Papers

Volume-3

Agriculture, Land Management and Urbanization

General Economics Division (GED)
Bangladesh Planning Commission
Ministry of Planning
Government of the People's Republic of Bangladesh

Agriculture, Land Management and Urbanization

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M.A. Mannan, MP
Minister
Ministry of Planning
Government of the People's Republic of Bangladesh

Message

I am happy to know that the General Economics Division (GED) of the Planning Commission is publishing the background papers conducted for the preparation of Eighth Five Year Plan (July 2020-June 2025).

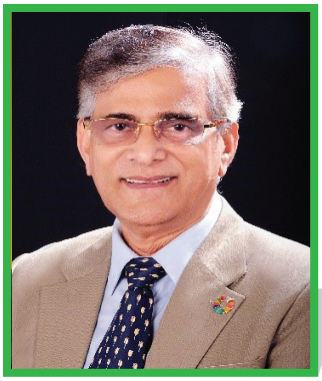
The background papers have been provided with valuable inputs on both quantitative and qualitative data. These studies have made it easier to identify the areas of interventions and proposed some policy recommendations on how to achieve the targets set by the government in the 8th Five Year Plan.

Bangladesh has made commendable progress in MDGs. The success also continues in SDG period which is reflected by the SDG Progress Award received by honorable Prime Minister Sheikh Hasina from Sustainable Development Solution Network. Despite the achievement, we have to go a long way to materialize the dream of Father of Nation to become a happy and prosperous nation. We should not be complacent as we have to carry out the ongoing rapid transformation of the country. I hope these studies will be a useful reference for the policymakers, development partners, academics and researcher alike to further research endeavors and knowledge sharing and I would like to see the continuation of such publications in the future as well.

I am confident that the Eighth Five Year Plan will amply guide us in realising the agenda of our "Vision 2041" of becoming a High-Income Country (HIC) by 2041.

In this instance, I would like to take this opportunity to thank the state minister for Planning and GED officials for this initiative and hard work. My sincere appreciation goes to the experts in their respective fields for completing the Background Studies for the Eighth Five Year Plan preparation.

(M. A. Mannan, MP)



Dr. Shamsul Alam
Minister of State
Ministry of Planning
Government of the People's Republic of Bangladesh

Message

I am glad that General Economics Division (GED) of Bangladesh Planning Commission is going to publish background papers which have been used as the inputs for preparing the country's Eighth Five Year Plan (July 2020-June 2025). These papers are the culmination of macroeconomic and sectoral issues of Bangladesh for future intervention that GED has pursued with various eminent economists, social scientists, researchers, academia etc. at national level.

These background papers were undertaken for generating quantitative/qualitative benchmark values and targets for relevant indicators of the Plan and fill in critical knowledge gaps. Renowned economists and development practitioners in the relevant fields with a long-standing flair were assigned to conduct the studies within the stipulated timeframe.

In the light of Vision 2041, the Eighth Plan looks to improved standard of living of the citizens, population better educated, better social justice and a more equitable socio-economic environment. Special emphasis was given on the investment of health and education as well as skill development of the upcoming and existing labor force. We must act now to protect the cognitive capital of our future generation and I believe we can act more vigorously because recent positive trends in Bangladesh's development give us that confidence. We can act more purposefully because it is evident that research-based policy making and practice can be successful in Bangladesh.

I congratulate the GED for taking up this bold and timely initiative. I would like to thank the authors and also the organizations who have contributed to prepare these background papers. Well Documented background papers will also be helpful for policy planners, development practitioners, researchers, academicians and even students as well. I expect that the background papers will be valuable for the officials of GED to prepare necessary policy briefs and write-ups they often prepare. I believe that not only GED but also other relevant officials will be immensely benefited with these background papers for upgrading and updating their knowledge and professional competences.

Finally, I convey my gratitude towards our Honorable Minister, Ministry of Planning, Mr. M.A. Mannan, MP for his guidance, instructions and continuous support in making this publication a reality.

(Dr. Shamsul Alam)

Dr. Md. Kawser Ahmed
Member (Secretary)
General Economics Division (GED)
Bangladesh Planning Commission

Foreword

It is of immense pleasure that General Economics Division (GED) of Bangladesh Planning Commission is going to publish background papers which have been used as the inputs for preparing the country's Eighth Five Year Plan (July 2020-June 2025).

For developing the Plan strategies and indicating the desirable development path that would lead to fulfilling its objectives, twenty different background studies covering different socio-economic sectors and sub-sectors, and a technical framework for macroeconomic projection for FY21-25 were prepared. Renowned economists and development practitioners in the relevant fields with a long-standing flair were assigned to conduct the studies within the stipulated timeframe.

These background studies are rich in contents and, if made available, will enrich the knowledge base relating to development challenges and development options facing Bangladesh. The background papers are going to publish in five separate volumes which will help the readers to understand the rational for the choice of the specific domain underlying the Plan and the design of the policy package adapted for the Plan for reconciling the goals of efficiency with those of equity.

I would like to express my deep gratitude to the authors and reviewers of the background studies for their sincere efforts in finalising the manuscripts in time. I am also indebted to the relevant officials of GED for their untiring support and cooperation in managing all the studies. I hope that the relevance of the issues and the diverse contents and analyses would make these volumes useful for the research community, policymakers, and others who are interested in understanding the development challenges of Bangladesh. I believe, readers would find all these approach papers of the Eighth Five Year Plan as source of rich treasure of knowledge and insights.

Dr. Md. Kawser Ahmed

Acknowledgements

The preparation of Eighth Five Year Plan (8FYP) was commissioned in 2019. Initially, a 'National Steering Committee' was formed under the chairmanship of the Hon'ble Minister of Planning to oversight the preparation of the plan. A Panel of Economists', under the chairmanship of Dr. Wahiduddin Mahmud, was also formed comprising luminous Bangladeshi economists, sociologists, educationalists and experts on relevant fields, who gave continuous support in shaping the 8FYP. In this important initiative, General Economics Division (GED) ensured partnership of all the ministries/divisions/agencies, policy makers, academia, civil society organizations, NGOs, development partners, think-tanks and thought leaders in formulating this plan. A total of twenty (20) background studies were conducted with the help of the eminent experts in their respective fields. As GED is going to publish the background studies in 05 volumes, it would like to exert its gratitude to all the stakeholders involved.

First and foremost, GED would like to express its humble gratitude to the Hon'ble Prime Minister and the Chairman of the National Economic Council (NEC) H.E. Sheikh Hasina for her strategic direction and well-judged suggestions for finalizing the 8FYP.

GED is thankful for the guidance and timely direction provided by the Hon'ble Minister, Ministry of Planning Mr. M.A. Mannan, MP. His visionary leadership expedited the process of finalizing the 8FYP.

We are indebted to the outstanding leadership of Dr. Shamsul Alam, Hon'ble Minister of State, Ministry of Planning. He led the review and editorial process of the background papers and guided us to formulate the 8FYP.

Our heartfelt thanks to Mr. Md. Mafidul Islam, Chief, GED for his coordination and guidance in conducting the background studies. This would have not been possible without the extensive technical support from Mr. Md. Mahbubul Hoque Patwary, Joint Chief; Ms. Munira Begum, Joint Chief; Mr. Md. Mahbubul Alam Siddiquee, Deputy Chief; Mr. Mohammad Fahim Afsan Chowdhury, Senior Assistant Chief; and Mr. Shimul Sen, Senior Assistant Chief.

Finally, we would like to acknowledge with gratitude the continuing support being received from the officials and staff of the 'Preparation and Monitoring of Medium-Term Development Plans (8th Five Year Plan) to Implement SDGs and Vision-2041' project being implemented by GED for consolidating and publishing the aforesaid background studies in volume

Study 8:
Strategy for Agricultural Diversification, Raising Productivity and Ensuring Food Security and Nutrition

Rezaul Karim Talukder*

* National Advisor, FAO

1. Introduction

Bangladesh has made commendable socio-economic progress and earned the status of lower middle-income country in 2015. In the process the country has gained some global recognition in achieving the Millennium Development Goals (MDG) targets. The agriculture sector played an important role in the country's progress, by not only ensuring food security for her 160 million people, but also by creating employment opportunities for half of her population. The sector is the major driver of rural development and is the base of agro-based industries.

Diversified agriculture promotes nutritious diets. Although agriculture of the country is still dominated by rice, diversification is taking place, albeit slowly. In the process, though production of different food products has increased, their productivity is an issue. The country is not only one of the largest producers of paddy and jute, it has also been positioned in the list of top fisheries producing countries. Though there are some pockets for extreme poverty, according to the GED (2018a) 21.8% and 11.3% of the population live below the upper and lower poverty line respectively. Bangladesh reached the MDG target of undernourishment in early 2000s. Underweight and stunting has also declined.

Despite these impressive progresses, Bangladesh still faces formidable challenges in ensuring food and nutrition security for its growing population. These challenges include continuing, population growth, deceleration in the growth of agricultural productivity, increasing income inequality, decreasing availability of agricultural land and labour, increasing rate of urbanization and growing concern about food safety. Increasing income and urbanization have led to some dietary diversity, but cereals still account for the largest share of dietary intake. The on-going process of climate change can have serious impact on food production in Bangladesh. Increased salinity in the coastal areas may alter the nutritional contents of foods including rice which may become deficient in zinc and other micronutrients.

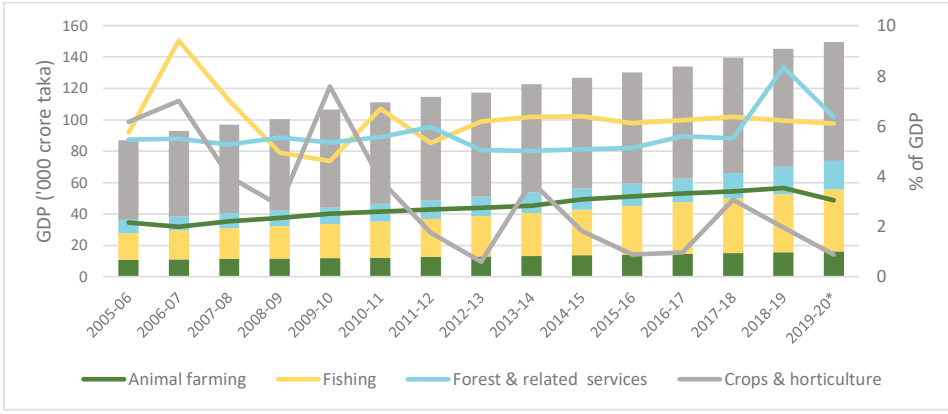
The government of Bangladesh, through policies and plans has consistently made commitment to the goal of achieving food security and nutrition for its people. Ever since the independence of the country in 1971, food security has been one of the primary agenda to be pursued by the government. In addition to the internal targets and commitments which have persistently been incorporated in the nutritional planning documents, the government has made international commitment to work towards targets agreed upon by various international bodies. For example, Bangladesh has signed and pledged to pursue the internationally agreed Sustainable Development Goals (SDGs). The second goal calls upon the nations to end hunger, achieve food security, improve nutrition and promote sustainable agriculture by the year 2030. To this end, the Government has prepared the National Agriculture Policy 2018. The government is also in the process of finalization of a new National Food and Nutrition Security Policy (NFNSP) to cover the period 2030 in consonance with the target year for SDG. The NFNSP is also expected to be aligned with the formulation and implementation of the 8th and 9th Five Year Plans covering the whole period of 2020-2030.

2. Review of Performances of Agricultural Sector

Agricultural GDP in Bangladesh reached Tk. 1,49,645 crore during 2019-20 from Tk. 86,985 crore in 2005-06. The crops & horticulture sector contributed more than half to the

agricultural GDP. However, the growth of crops & horticulture gradually decreased while the fishing sector's growth accelerated followed by forest & related services and animal farming (Figure 1). Agriculture's contribution to national GDP is declining, which is a phenomenon for all types of economies (Anderson, 1987).

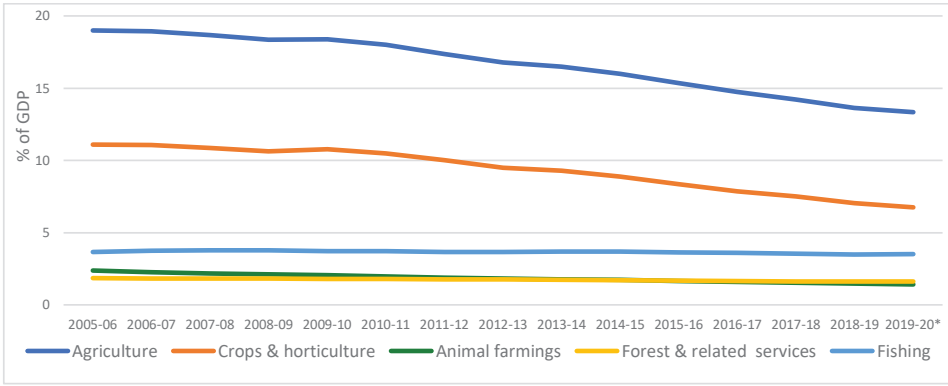
Figure 1: Agricultural GDP and its growth rate (at constant prices, base year: 2005-06)



Source: Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.
Note: * Provisional

From 19.01% in 2005-06, agricultural GDP share in 2019-20 reduced to 13.35%. Among the four sub-sectors, rate of decline was more pronounced for crops & horticulture and animal farming, and less for fishing (Figure 2).

Figure 2: Agricultural GDP share (%) at constant prices (base year: 2005-06)



Source: Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.
Note: * Provisional

Historically, agriculture is the primary source of employment in Bangladesh, particularly in the rural areas and for the vast army of uneducated and unskilled labour. Though the importance of the sector in GDP is gradually declining, as other sectors are growing, still 40.6% of the total employment is from this sector. Importantly, women labour participation in agriculture is increasing and during 2016-17, around 60% of the women were employed

in the sector (Table 1). The women participation rate is likely to be underestimated since they mostly contribute as unpaid family labour, which is often unaccounted (FAO, 2013).

Table 1: Share of employment trend in agriculture, forestry and fishery (%)

	2005-06	2010	2013	2015-16	2016-17
Total employment	48.0	47.5	45.1	42.7	40.6
Female employment	68.1	64.8	53.5	63.1	59.7

Source: Labour Force Survey, various years

Increased agricultural production not only led to increased food availability within the country, but also contributed to foreign currency earning. Foreign currency earning from exporting both primary and secondary agricultural product increased significantly (Table 2).

Table 2: Value of agricultural products exported as primary commodities (in million US$)

Fiscal years	Agricultural commodity		
	Primary	Secondary	Total
2011-12	1171	1031	2202
2012-13	1127	1201	2328
2013-14	1170	1205	2375
2014-15	1022	1155	2177
2015-16	1019	1025	2044
2016-17	973	1027	1900
2017-18	1048	1053	2101
2018-19	1052	869	1921
2019-20*	1061	850	1911
Growth rate (2004-05 to 2019-20) (%)	3.065***	4.593**	3.772***

Source: Bangladesh Economic Review 2020. Ministry of Finance, Government of Bangladesh, Dhaka.
Note: The annual exponential growth rate is the parameter β in $\ln Y=\alpha+\beta t$.[1]

2.1 Review of progress made during the 6th and 7th plan periods on agricultural growth, diversification, food security and nutrition

A major thrust of the 6th and 7th FYP was to attain and maintain self-sufficiency in rice production and meet the nutritional requirement of the population through supply of adequate and diverse range of foods while ensuring environmental sustainability and farm level profitability. Against the set target of 4.5% real growth in agricultural sector over the 6th plan period, the sector could attain 3.5% growth rate. The shortfall here is mainly due to poor performance of the crop & horticulture sector. The poor performance of the sub-sector continued in the 7th FYP period and the average growth rate of the sector was 3.40% (Table 3).

1 In economics, there are two competing methods to calculate the growth rate of an indicator: compound growth rate and exponential trend function. The earlier one capitalizes growth from a previous period, and then add growth on the new value. It only considers the ending value and the starting value and changes are always at an increasing rate. Alternatively, the exponential trend function considers all observations through fitting a mathematical model. We have used the exponential growth estimation technique for its theoretical superiority.

Table 3: Agricultural GDP growth rate at Constant Prices (Base Year: 2005-06)

FY	Crops & horticulture	Animal farming	Forest & related services	Fishing	Total agriculture
2010-11	3.85	2.59	5.56	6.68	4.46
2011-12	1.75	2.68	5.96	5.33	3.01
2012-13	0.59	2.74	5.04	6.18	2.46
2013-14	3.78	2.83	5.01	6.36	4.37
2014-15	1.83	3.08	5.09	6.39	3.33
6th FYP average	2.36	2.79	5.33	6.19	3.53
2015-16	0.88	3.19	5.12	6.10	2.79
2016-17	0.96	3.30	5.60	6.23	2.98
2017-18	3.06	3.40	5.51	6.37	4.18
2018-19	1.96	3.54	8.34	6.21	3.92
2019-20*	0.89	3.04	6.21	6.10	3.11
7th FYP average	1.55	3.29	6.16	6.20	3.40

Source: Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.

Bangladesh has already achieved the production targets set in the Perspective Plan of Bangladesh 2010-2021 for crops like pulses and maize, whereas marginally lacks behind target for rice, wheat and potato (Table 4). The target shortfall for paddy and potato seems to be a plausible one by the end of the 7th FYP, given no sudden production shock including climatic ones are observed. But for wheat a major technological breakthrough is needed. The recently innovated BARI 33 variety may be the technology here which has around 25% higher yield compared to existing yield rate of the country. Two unique features of the variety are that it is heat and blast resistant and has medium (110-115 days) life span.[2]

Table 4: Production (m. MT) targets of selected agricultural crops in 7th FYP and achievements

Crops	Production in 2015	Target in 2021	Production in 2019
Rice	34.9	36.81	36.39
Wheat	1.16	1.40	1.02
Potato	8.76	10.34	9.66
Pulses	0.26	0.31	0.39
Maize	1.63	1.85	3.57

Source: GED (2019) and Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.

Development of new improved variety and increased availability of improved seeds – are two key elements to boost production and productivity. Several rice and non-rice improved varieties have been released on regular basis by the research institutes under National Agricultural Research System (NARS) and agricultural universities. While some of the newly released varieties can tolerate climate stress (draught or salinity), some has superior quality such as fine grain with aroma, and some are nutrition enriched (zinc-enriched or green super rice). It is praiseworthy that the innovations required very low share (0.38%) of the total agricultural value added as investment in Agriculture Science and Technology (ASTI) related expenditures, a share which did not improve satisfactorily over the years (Table 5).

2 http://bari.portal.gov.bd/sites/default/files/files/bari.portal.gov.bd/page/3c28026f_861e_4f04_8831_84cb5afe5de6/Variety%20July%202017-Jun%202018%20%281%29.pdf

Table 5: Achievements of some of the diversification related 7th FYP objectives and targets

Proxy indicators	2007-08	2009-10	2013-14	2014-15	2015-16
No. of improved new varieties					
Paddy	3	9	8	9	10
Other crops	11	23	20	32	28
Annual change in improved rice, wheat and maize seeds production	6.4%	6.3%	-26.0%	14.6%	-0.3%
ASTI-expenditures as share of value added (agriculture, forestry and fishing) (%)	0.32	0.38	0.37	0.35	0.38
Indicators related to sustainable agriculture					
% of cropped area under irrigation	44.2%	45.3%	48.21%	48.6%	48.24%
Surface water irrigation area as % of total irrigation area	23.3%	22.0%	21.5%	21.1%	21.1%
Water table depth in Northern region, average yearly change over the last 3 years (cm/year)	15.4				
(2006-2008)	45.9				
(2008-2010)	48.0				
(2012-2014)	20.4				
(2013-2015)	42.67				
(2014-2016)					
Indicators related to fisheries and aquaculture development					
Annual change in hatchling production	-8.6%	-3.6%	0.2%	12.2%	12.17%
Number of new fish varieties developed	0	3			
(2008/09)	0	0	0		
Indicators related to livestock development with focus on poultry and dairy production					
Annual change in artificial insemination	1.56%	15.25%	2.91%	9.28%	6.27%
Annual change in number of poultry death due to avian flu	333%	274%	-97.99%	-66.7	0

Source: FPMU Food Security Monitoring Report 2017, Ministry of Food and FAOSTAT

Rational use of irrigation water is important for sustainability of the agricultural system. In the FYP documents and other related policy documents surface water irrigation is being increasingly emphasized. The share of cropland under irrigation remained steady and it reached to 48.24% in 2015-16, which is 3% higher than the level period before starting the 6th FYP (Table 5). The Government's various initiatives, e.g. establishment of power pump, construction of irrigation structure and pipelines, introducing alternate wetting and drying (AWD) methods, and rehabilitation of out of order deep tube wells contributed to the expansion of irrigation areas. But the environmental concern remains as the share of surface water irrigation areas has a decreasing trend and the groundwater depth level in the northern region has deteriorated in 2016.

Increasing fisheries and livestock production in a sustainable way by improving technological adoption, animal health and resilient management practices are key elements for agricultural diversification and improving nutrition security. In 2013-14 the declining trend in hatchling production has been rebounded (Table 5). No fish variety development has taken place except in 2008-09 when three varieties were released. The annual change rate of artificial insemination has an erratic pattern, though it was always positive during

the reference period. The country has some real success in reducing poultry death. Since 2013-14 poultry death due to avian flu has reduced and in 2015-16 there was no death reported (Table 5).

Despite the well documented and multifold benefits of breastfeeding for both infants and mothers and awareness programs at multiple levels, exclusive breastfeeding (EBF) rates of infants under 6 months has declined. The share of total dietary energy supply from different food groups including animal sources, slightly improved, whereas consumption of cereals, particularly rice is decreasing. Marginal improvement in acute child malnutrition situation is observed. There is marginal decline in global acute malnutrition (GAM) from 14.3% in 2013-14 to 10.0% in 2015-16 and in severe acute malnutrition from 3.1% to 2.0% during the same period (Table 6). The prevalence of diarrhea among children under five years (in the previous two-week period) slightly decreased.

Almost all citizens in the country have access to safe water supply in Bangladesh and sanitation facilities improved notably. FSNSP 2015 reported that the proportion of people without any toilet facilities declined from 7% in 2011 to 4% in 2014, which remained static in 2015 (Table 6).

Table 6: Achievements of some of the nutrition security related objectives and targets of the 7th FYP

Proxy indicators	2007-08	2008-09	2013-14	2014-15	2015-16
Proportion of infants under six months exclusively breastfed	43% (2007)	--	55.3% BDHS	47% SFSN	--
Share of total dietary energy supply for consumption from cereals	78.6% (2005)	--	77.0% (2011)	76.3% (2013)	--
Prevalence of global acute malnutrition (GAM) among children < 5 years <- 2SD	17.4%	13.5% (HFSNA)	14.3% BDHS	11% SFSN	10% SFSN
Prevalence of severe acute malnutrition (SAM) among children < 5 years < 3SD	2.9%	3.4%	3.1% BDHS	2 % SFSN	2% SFSN
Prevalence of diarrhea in under 5 children (in two-week period)	10% BDHS	14% (SFSN 2010)	10% SFSN 5.7% BDHS	9% SFSN	8% SFSN
Proportion of population served with safe water supply for domestic use	97%	98%	99%	99%	99%

Source: FPMU Food Security Monitoring Reports (various years), Ministry of Food

3. Agricultural Diversification

Pingali and Rosegrant (1995) defined diversification as change in product (or enterprise) choice and input use decisions based on market forces where the main moto is profit maximization. At the farm level, diversification will represent a change in the underlying characteristics of the farming system such that farm practices and products are more aligned with the social, environmental, and economic contexts, as well as the constraints and opportunities that exist (Barghouti et al., 2004).

Crop diversification is commonly defined as the addition of more crops to an existing cropping system (Adjimoti et al., 2017). In the process, based on market potentials low-value crops are replaced by high-value ones (Clements et al., 2011). Diversification promotes mixed farming when a farmer integrates crops and non-crop enterprises (e.g. livestock) (Bacon et al., 2014). Agroforestry is an example of diversification where a farmer integrates crops and trees (Altieri et al., 2015). Table 7 presents a non-exhaustive list of the examples of diversification in agricultural systems.

Table 7: Examples of diversification in agricultural systems

Diversification types	Description of diversification
Increased structural diversity	It makes crops within the field more structurally diverse; for example, strip intercropping, which consists of the production of more than one crop in strips that are narrow enough for the crops to interact, yet wide enough to permit independent cultivation.
Genetic diversity in monoculture	Growing mixed varieties of a species in a monoculture.
High-value crops	Shifting from low-value crop or cropping system with more profitable and sustainable crop or cropping system.
Crop rotations	Temporal diversity through crop rotations.
Polyculture	Growing two or more crop species and wild varieties within the field. Spatial and temporal diversity of crops.
Diversify field with non-crop vegetation	Growing weed strips or vegetation banks in and alongside crops.
Mixed farming	Crops and livestock
Agroforestry	Growing crops and trees together
Mixed landscapes	Development of larger scale diversified landscapes with
multiple ecosystems	

Source: Modified from Lin (2011)

Numerous benefits of diversification at both micro and macro level are discussed in the literature. Some important ones are listed in Table 8.

Table 8: A review of potential benefits from diversification

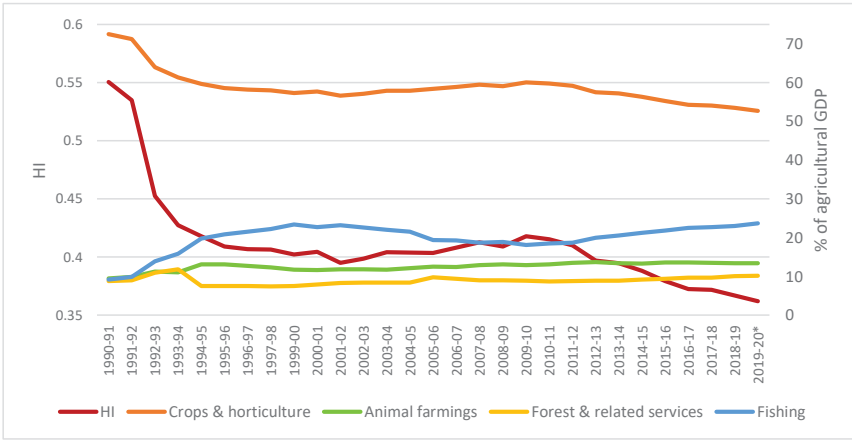
Potential benefits		Study
Farm production, productivity, and income	- Increases farm production, income and profit - Increases productivity even in an ecologically fragile agricultural system - Contributes in farm efficiency - Livelihood resilience - Increases yield and ensures yield stability - Poverty alleviation	Guvele (2001); Van den Berg et al., (2007); Coelli and Fleming (2004); Cowger and Weisz (2008); Di Falco and Chavas (2009); Njeru (2013)
Food and nutrition security	- Increases availability of diversified nutritious food at both household and regional level - Enhances access as farmers earn more	Mango et al. (2018)

Potential benefits		Study
Employment	High value crops are - More labour intensive and requires more value addition activities - More strongly interlinked with other sectors of the economy	Ali and Abedullah (2002); Barghouti et al. (2004)
Risk management	- Smoothening the flow of income by reducing both predictable and unpredictable fluctuations in yield and price - Insurance against environmental, ecological and economic risk associated with uncertainty and variations of net income	Valdivia et al (1996); Barghouti et al. (2004); Njeru (2013)
Sustainability	- Reduces natural resource (e.g. soil and water) degradation and increases resource use efficiency - Natural resource preservation - Brings about higher and spatial temporal biodiversity on the farm and increases ecosystem resilience	Anosike and Coughneour (1990); Wu et al. (1995); Njeru (2013)

3.1 Status of Agricultural Diversification

Agricultural diversification in Bangladesh is increasing, and the pace has accelerated during this decade. The estimated Herfindahl Index (HI) agricultural diversification value for the year 2019-20 is 0.362, indicating a quite high level of diversification. During the early '90s the country had moderate level of diversification (0.550), where crops & horticulture contributed more than 70% of the total agricultural GDP. The share rapidly declined during the first half of the decade while the diversification increased more rapidly (Figure 3).

Figure 3: Herfindahl Index of agricultural diversification and sectoral contribution to agricultural GDP (at current price)



Source: BBS & Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.
Note: The Herfindahl index of agricultural diversification estimated to measure the level of agricultural concentration is defined as $D_H=\alpha_j^2, 0\leq D_H\leq 1$, where αj = share of gross domestic product (at current price) by particular sub-sector (e.g. crops & horticulture, animal farming, forest and related services, fishing) in year t. A zero value means complete diversification and a value of 1 means complete specialization. Joshi et al. (2003) also used value of output while estimating agricultural diversification across South Asian countries.

During the last three decades, the contribution of the crops & horticulture sector reduced by 0.581% per annum (Table 9) and currently the sub-sector contributes roughly around half of the agricultural GDP (Figure 3). Meanwhile, the contribution of animal farming and fisheries sub-sectors in GDP grew annually by 0.881% and 1.476%, respectively (Table 9).

Table 9: Annual growth rate of sectoral contribution to agricultural GDP and level of agricultural diversification (1990-91 to 2019-20)

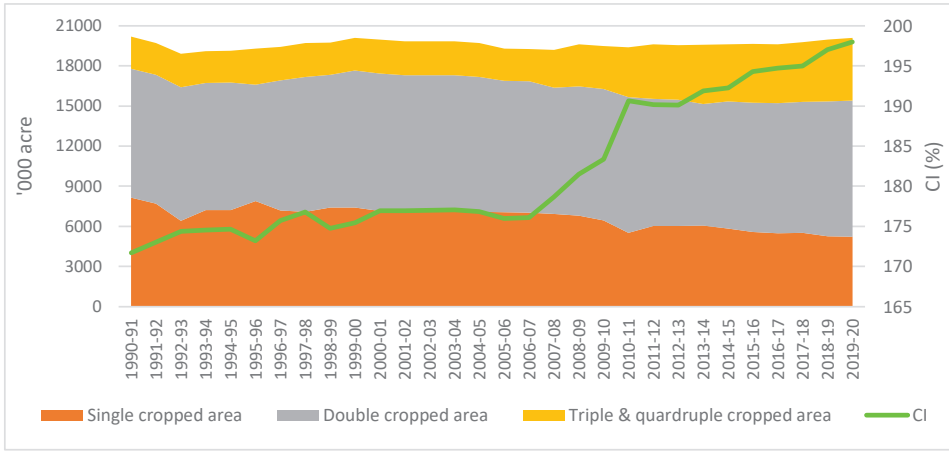
		Growth rate (%)
% of agricultural GDP (at current price)	Crops & horticulture	-0.598***
	Animal farming	0.844***
	Forest & related services	0.425***
	Fishing	1.464***
HI of agricultural diversification		-0.782***

Source: Authors' calculation based on data from BBS & Bangladesh Economic Review, various years
Note: The annual exponential growth rate is the parameter β in $\ln Y = \alpha+\beta t$.

3.2 Changing land use pattern

Agricultural diversification in Bangladesh is associated with changing land use pattern. A major source of diversification is changing single cropped areas to multiple cropped area. Figure 4 shows that while the net cropped area during the last three decades has decreased, area cultivated more than once in a year has increased notably. Meanwhile cropping intensity during the last three decades has increased by around 14% which is currently 198%.

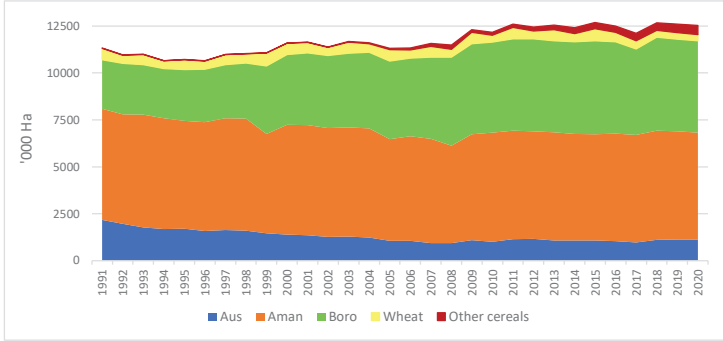
Figure 4: Changing land utilization pattern



Source: Yearbook of Agricultural Statistics, Bangladesh Bureau of Statistics, various years

Historically, cereals dominated Bangladesh agriculture, occupying roughly around 80% of the gross cropped area (GCA), which is declining at a rate of 0.074% per annum (Table 10). Importantly, there have been notable changes in the composition of area under cereals. While Aus paddy and wheat area declined at a noticeable rate during the last three decades, area under Boro paddy and other cereals increased notably (Figure 5).

Figure 5: Pattern and trend of area under cereals



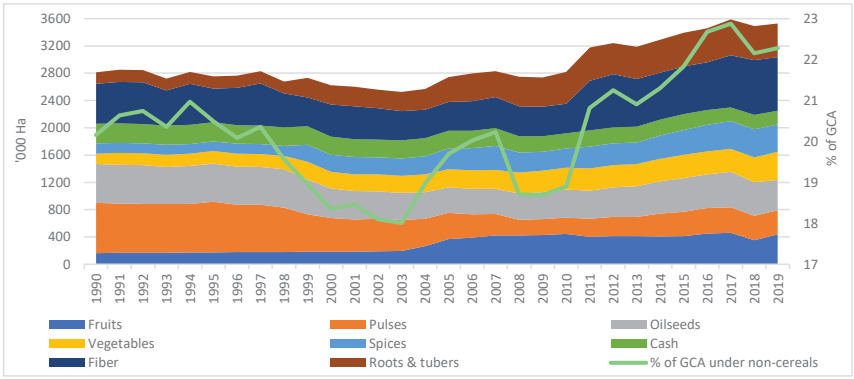
Source: Yearbook of Agricultural Statistics, Bangladesh Bureau of Statistics, various years.

Table 10: Annual average growth rate of area allotted to different crops (1991-2018)

Crops	Growth rate (%)
Aus	-2.238***
Aman	-0.104
Boro	2.535***
All paddy	0.523***
Cereals	0.490***
Fruits	4.507***
Pulses	-3.679***
Oilseeds	-0.750**
Vegetables	2.932***
Spices	4.123***
Cash	-1.189***
Fiber	1.267***
Roots & tubers	4.734***
Non-cereals	0.945***

Source: Authors' calculation based on Yearbook of Agricultural Statistics and FAOSTAT data
Note: The annual exponential growth rate is the parameter β in $lnY = \alpha + \beta t$.

Figure 6: Pattern and trend of area under non cereals



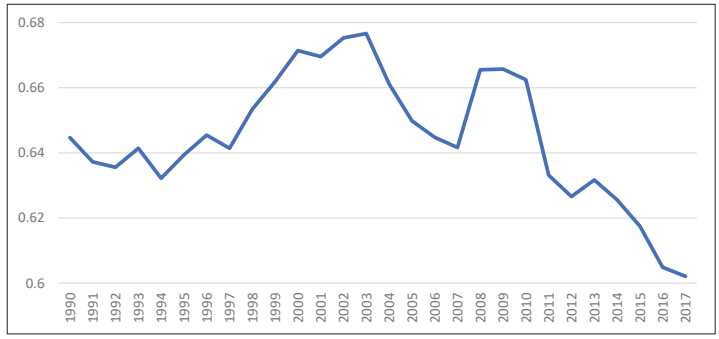
Source: FAOSTAT

From 28,11,904 ha in 1990, the GCA under non-cereals in 2019 increased by around 25% (Figure 6) at a rate of 0.768% per annum (Table 10). During the period, area under fruits, vegetables, spices, fiber and roots & tubers increased, while area decreased for pulses, oilseeds and cash crops. Most notable increase occurred for roots & tubers (5.007% per annum), fruits (4.828% per annum) and spices (4.195% per annum) (Table 10). Pulse area annually decreased at a rate of 4.200%, particularly the downward trend is more notable during 1996 to 2008, since 2009 the trend reversed. Similar upward trend is observed for all types of non-cereals, except cash crops (Table 10).

3.3 Pattern and trend of crop diversification in Bangladesh

Till 1997 diversification remained almost stagnant, then took downward trend which continued till 2003 and since then the trend is almost downward, with exception during 2008-09, the two years of global food crisis (Figure 7). Though crop diversification during the last three decades has increased, the rate is only 0.136% per annum and the estimated score of 2017 (0.602) indicates that diversification is still below moderate level.

Figure 7: Herfindahl index for crop diversification



Source: FAOSTAT

Note: The level of crop concentration is defined as D_H=α_j^2,0≤D_H≤1, where α_j = area share occupied by the jth crop in year t. A zero value means complete diversification and a value of 1 means complete specialization.

It is noteworthy to mention that, though maize is a cereal, in Bangladesh it is mainly used for poultry feed and hence is a commercial crop. Maize occupies almost all the area under other cereals, which prior to 2000 was occupied by other cereals, mainly barley. If maize is considered as cash crops, the HI value would have been 0.567.

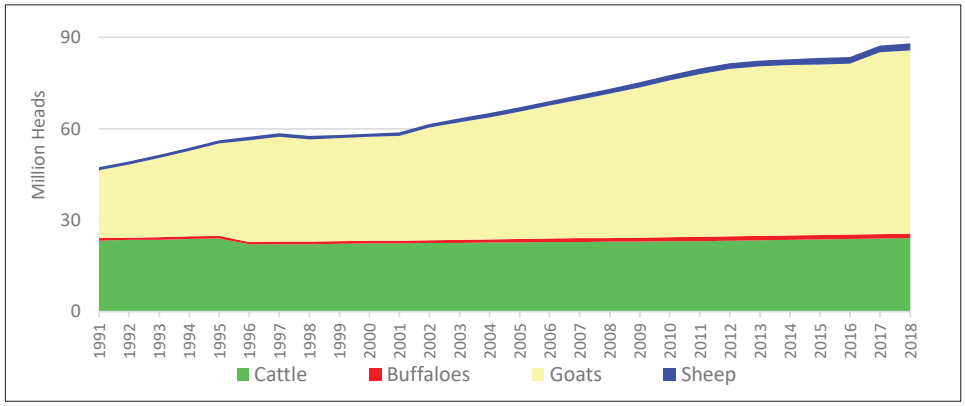
3.4 The interlinkage between crop-diversification, cropping-pattern and cropping-intensity

Any change in the existing cropping pattern means changes in crop diversification also. But cropping intensity will not change if the new crops are introduced as substitute of the existing ones. We observe there has been steady increase in crop diversification, the share of harvested area under rice steadily decreased and an accompanying increase in the share of harvested area growing non-cereals. Meanwhile cropping intensity increases sharply. These dynamics imply that Bangladeshi farmers do not substitute cereals with other crops, rather they grow non-cereals (mainly horticulture, spices and roots & tubers) along with cereals through intensifying land use.

3.5 Pattern and trend of livestock & poultry product diversification in Bangladesh

Livestock contributes roughly around 14% of agricultural GDP[3]. During last three decades, the number of both ruminant and poultry birds in the country increased (Figure 8 & Figure 9), annually by 2.248% and 4.087% respectively (Table 11). Interestingly, cattle which was half of the total ruminant population till the beginning of 1990s, is replaced by small ruminants, particularly goats, which is currently around 70% of the total livestock population (Figure 8).

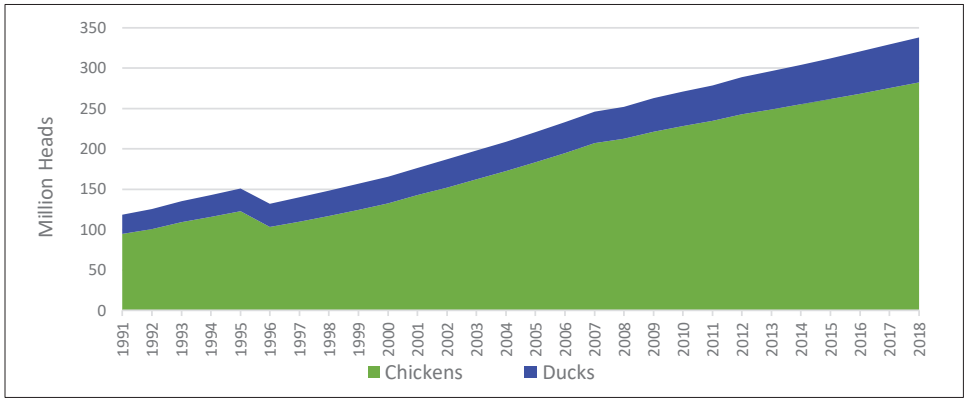
Figure 8: Number of ruminants



Source: FAOSTAT

During the last three decades, there has been marginal increase in cattle numbers (Figure 8). Though in recent years, there has been notable increase in the number of cattle for beef and milk purpose, the total cattle number remained almost unchanged since in rural areas use of cattle for draft purpose has drastically reduced. Among poultry population, around 80% is chicken and the share remained almost unchanged during the last three decades with around 5% point deviation (Figure 9).

Figure 9: Number of poultry birds



Source: FAOSTAT

3 http://dls.portal.gov.bd/sites/default/files/files/dls.portal.gov.bd/page/ee5f4621_fa3a_40ac_8bd9_898fb8ee4700/Livestock%20Economy%20at%20a%20glance%20%20%282017-2018%29.pdf

Table 11: Annual average growth rate of number of animals (%)

	Ruminant				Poultry Birds		
	Buffaloes	Cattles	Goats & sheep	Total	Chickens	Ducks	Total
Growth rate	2.723***	0.119*	3.469***	2.248***	4.336***	2.961***	4.087***

Source: Authors' calculation using FAOSTAT data

Note: The annual exponential growth rate is the parameter β in $\ln Y=\alpha+\beta t$.

Livestock products contribute around 90% of the total animal protein in Bangladesh. The country has achieved self-sufficiency in meat production, while in case of egg the gap between demand and production is gradually reducing.[4] Since 1990s, milk production in the country has increased at a rate of 8.018% per annum, and meat and egg production grew annually at a rate of 2.981% and 6.677% respectively. Though egg from hen has an impressive annual growth rate (6.527%), egg from other birds has relatively higher rate of growth (7.073%) (Table 12). Compared to that of early '90s, milk production has roughly increased by more than 9 times (Figure 10), but still the country is in gross deficit situation since the production could meet around 63% of the total milk demand (DLS, 2020). Meanwhile meat production has been doubled (Figure 11) and egg production is around eight times higher (Figure 12). Production of all the three livestock products took sharper upward trend since the beginning of the century, particularly after 2005.

Table 12: Annual average growth rate of animal products during 1990-2018

Products	Growth rate (%)
Milk	8.018***
Meat	
Buffalo	3.459***
Cattle	1.282***
Goat & sheep	4.067***
Total ruminant	2.515***
Chicken	4.203***
Duck	2.851***
Total poultry	3.885***
Total meat	2.981***
Eggs	
Hen	6.527***
Other birds	7.073***
Total	6.677***

Source: Authors' calculation using FAOSTAT data
Note: The annual exponential growth rate is the parameter β in $\ln Y=\alpha+\beta t$.

4 http://dls.portal.gov.bd/sites/default/files/files/dls.portal.gov.bd/page/ee5f4621_fa3a_40ac_8bd9_898fb8ee4700/Livestock%20Economy%20at%20a%20glance%20%20%282017-2018%29.pdf

Figure 10: Milk production trend

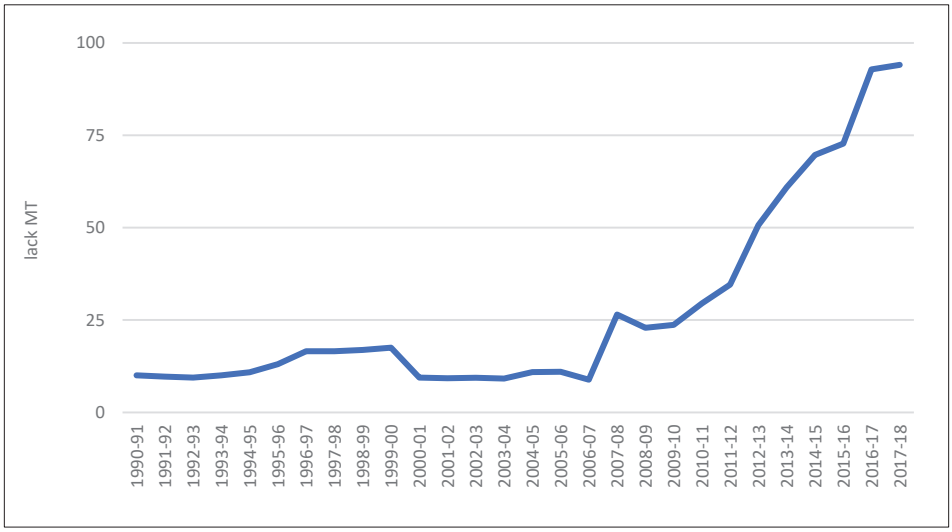


Figure 11: Meat production trend

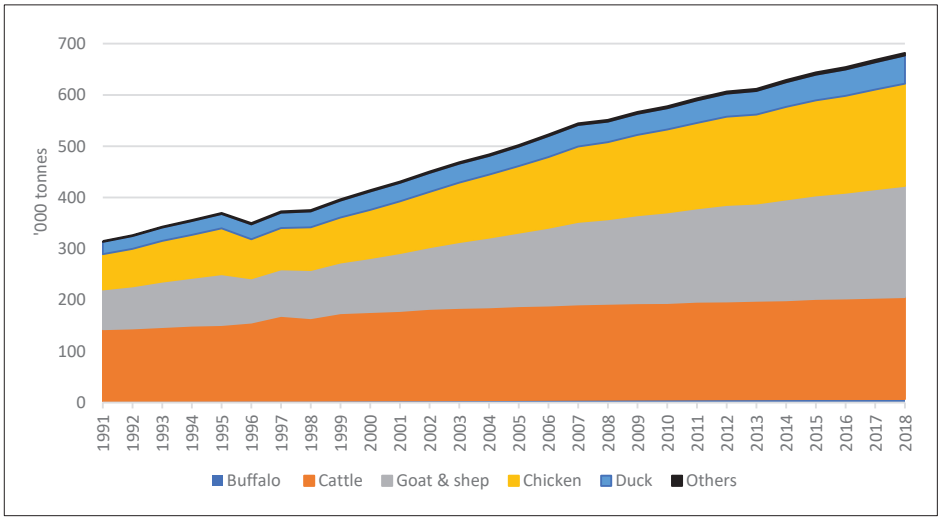
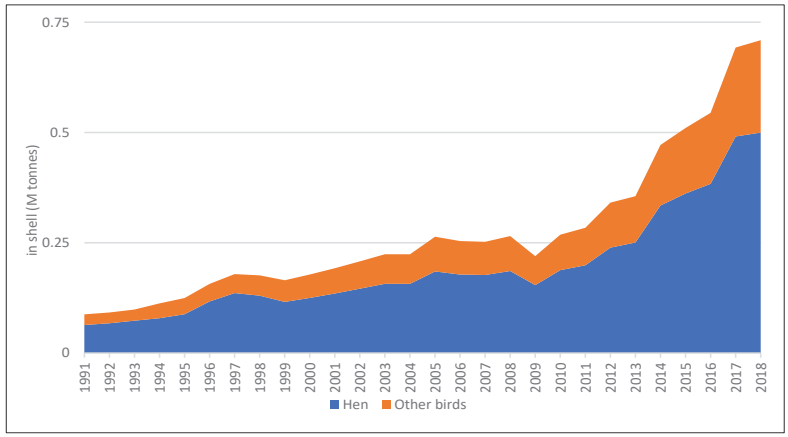


Figure 12: Egg production trend

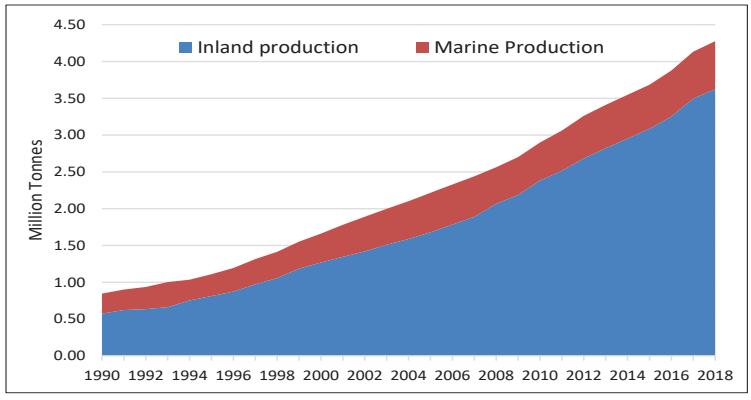


Source: BBS & FAOSTAT

3.6 Pattern and trend of fisheries product diversification in Bangladesh

Bangladesh has achieved remarkable success in fish production. The country has not only achieved self-sufficiency in fish production, but it also ranks 3rd in producing fish from inland waterbodies, 5th in aquaculture production and 11th in marine fish production.[5] Since 1990, fish production has increased by more than five times. Total fish production is estimated 4.277 million MT in 2018, where the annual growth rate is 5.936% (Figure 13). The two major contributing factors here are: (i) pond aquaculture using hatchery produced fingerlings; and (ii) conversion of fishponds by raising embankments around low-lying lands (Mujeri, 2020). Compared to marine production growth rate (3.249%), inland production growth rate (6.744%) was much pronounced, which is historically the major supply source of fisheries products (Figure 13). Annual catch of all types of fishes has increased, except snake head (Figure 14). Growth rate was highest for catfish (22.717% per annum), followed by live fish (7.651% per annum), hilsha (4.946% per annum) and carp (4.603% per annum) (Table 13).

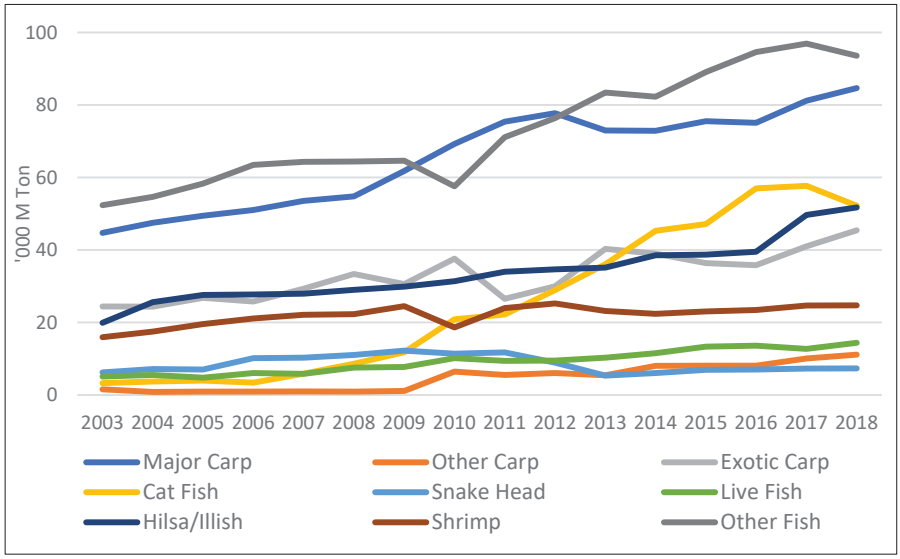
Figure 13: Trend in inland and marine fisheries production



Source: Yearbook of Fisheries Statistics of Bangladesh, various issues

5 http://www.fao.org/3/i9540en/i9540en.pdf

Figure 14: Species/Group-wise catch in inland & marine fisheries



Source: Yearbook of Fisheries Statistics of Bangladesh, various issues

Table 13: Annual average growth rate of different fisheries product (%) during 2003-18

Products	Growth rate (%)
Carp	4.603***
Major carp	4.270***
Exotic carp	19.616***
Other carp	3.658***
Catfish	22.717***
Snake head	-1.330
Live fish	7.651***
Hilsa	4.946***
Shrimp	2.124***
Other fish	4.155***

Source: Authors' calculation using data from Yearbook of Fisheries Statistics of Bangladesh
Note: The annual exponential growth rate is the parameter β in $lnY = \alpha + \beta t$.

3.7 Review of existing productivity status of crop and non-crop sectors

3.7.1 Crop agriculture

During the years of Green Revolution, expansion of crop area, particularly area under paddy, was the major source of agricultural growth in Bangladesh. It is estimated that annually 1% of the country's agricultural land is diverted to non-agricultural purposes (Planning Commission, 2009). Another growth contributing factor was conversion of traditional rice to modern varieties which largely contributed to the growth in paddy production (@ 2.34%/annum) during the period 1973-99 (Baffes and Gautam, 2001). But further conversion potential is limited as in the Aman season around 77% of the total land is already under modern variety (BBS, 2019), whereas Baffes and Gautam (2001) set the upper bound of conversion into modern varieties at 85%. Therefore, most viable

option for the country to increase production is increasing productivity through eliminating inefficiencies in the production process.

Table 14: Annual average yield growth rate of major crops (%) during 1991-2018

Crops	Growth rate	Crops	Growth rate
Food crops		Vegetables	
Aman	1.893***	Beans, green	1.812***
Aus	3.205***	Cabbages and other brassicas	2.331***
Boro	2.071***	Cauliflowers and broccoli	2.276***
Paddy	2.634***	Tomatoes	2.171***
Wheat	1.971***	Fruits	
Maize	9.741***	Bananas	0.170
Pulses		Lemons and limes	0.763***
Chick peas	1.222***	Mangoes, mangosteens, guavas	6.791***
Lentils	1.554***	Melons, other (inc. cantaloupes)	4.459***
Pigeon peas	3.547***	Papayas	-1.662***
Spices		Pineapples	1.530***
Ginger	1.955***	Cash crops	
Garlic	3.296***	Jute	1.183***
Onions, dry	4.169***	Rubber, natural	-0.073*
Chilies and peppers, dry	2.665***	Tea	0.560***
Roots & tubers		Tobacco, unmanufactured	2.838***
Potato	2.842***		
Sweet potato	0.238**		

Source: Authors' calculation based on data from Statistical Yearbook of Bangladesh (various years) and FAOSTAT
Note: The annual exponential growth rate is the parameter β in $\ln Y=\alpha+\beta t$.

Figure 15 to Figure 18 show per hectare yield of some of the commonly grown crops in Bangladesh. From only 1.711 mt/ha in 1991, paddy yield in 2018 increased to 3.233 mt/ha at a rate of 2.634% per annum. Among the three paddy growing seasons, annual growth rate is more pronounced for the Aus season paddy (3.205%), followed by the Boro (2.071% per annum) and Aman (1.893% per annum). A notable feature with the growth rate after 2000 is that, compared to the previous century it showed persistent sharper upward trend particularly in the Aus and Boro seasons. The recent policy shifts towards Aus paddy may have a role in explaining the season's increasing yield growth trend. The similar pattern of yield fluctuations observed in both the Aman and Aus season is perhaps due to the fact that farming in both the seasons is largely nature dependent.

With only a couple of exceptions (e.g. rubber and papaya) yield rate for all the major crops significantly increased. Some of the crops showing notable yield growth performances are maize among the cereals, pigeon peas among the pulses, garlic and onion from the category of spices and fruits like mangoes, guavas and melons (Table 14). Though yield rate for

most of the crops is increasing, it is generally known that Bangladesh has one of the lowest yield rates in the world, even compared to her neighboring countries. For instance, though Bangladesh is the world's second and fourth largest jute and paddy producer, she ranks 7th and 44th in terms of yield of the mentioned two crops[6]. Even for maize, the crop with highest yield growth rate, globally Bangladesh ranks 26th in terms of yield[7].

Figure 15: Yield trend of major food crops (mt/ha)

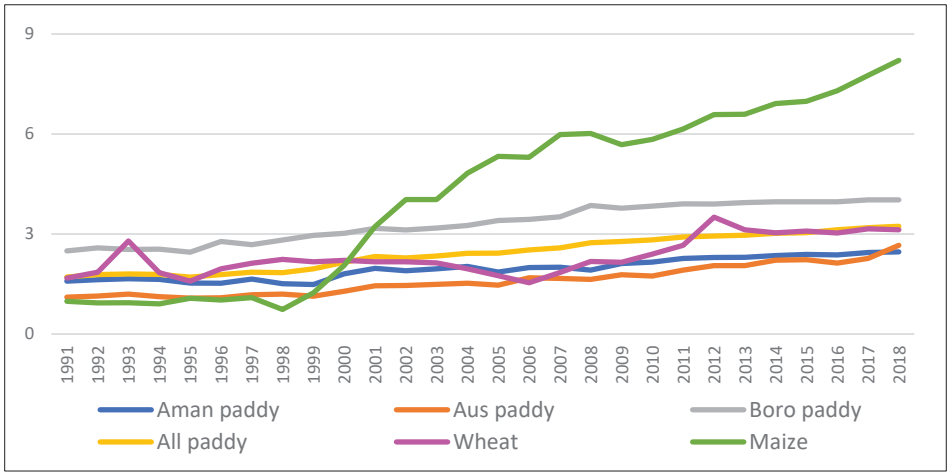
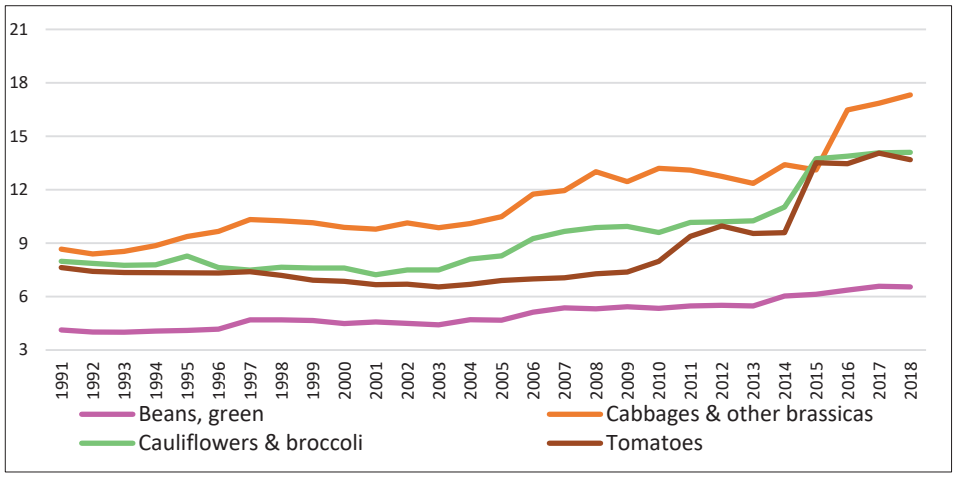


Figure 16: Yield trend of major vegetables (mt/ha)



6 http://www.factfish.com/statistic/rice%2C%20paddy%2C%20yield
7 http://www.factfish.com/statistic/maize%2C%20total%2C%20yield

Figure 17: Yield trend of roots and tubers (mt/ha)

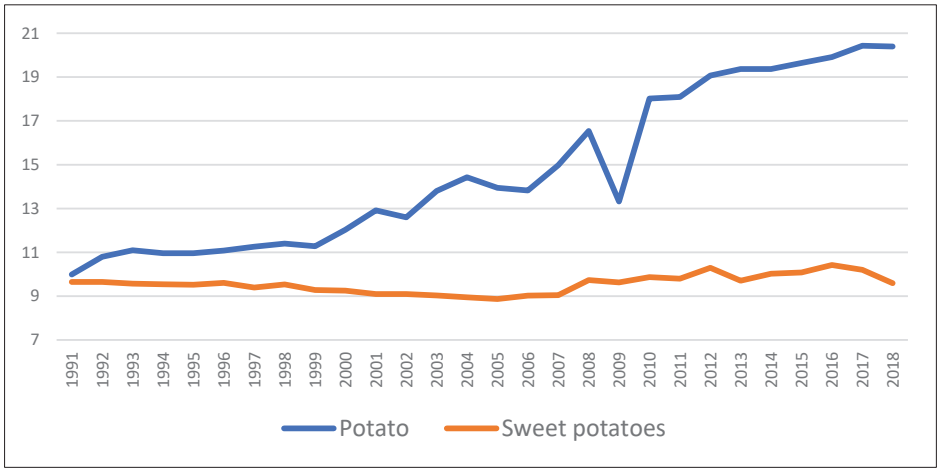
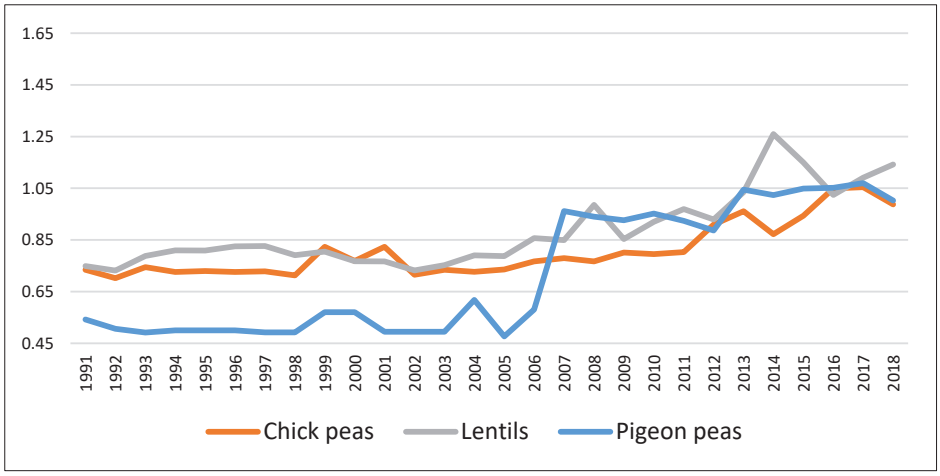


Figure 18: Yield trend of pulses (mt/ha)



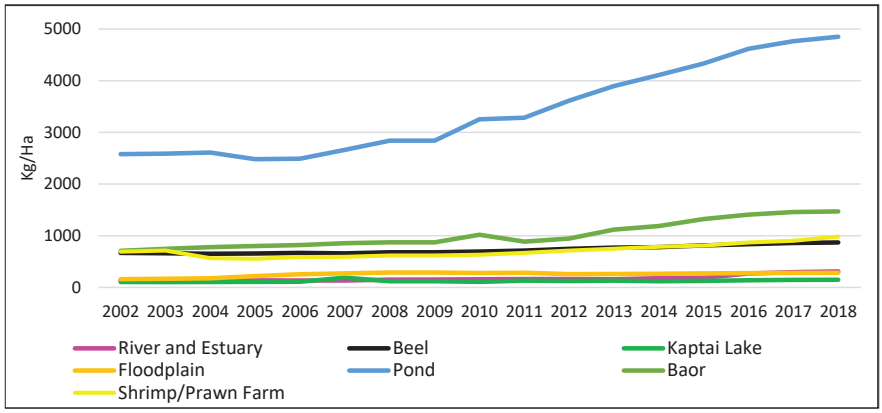
3.7.2 Livestock products

Though in terms of number of live animals, Bangladesh ranks in the quintile of top 10% for buffaloes, cattle, goats, chicken and duck, the yield rate of different livestock products during the last three decades has remained stagnant. This implies that the production growth is mostly attributed to increasing number of animal population. The productivity of all the major three types of livestock in Bangladesh is notably lower than her neighboring countries Bhutan, India, Nepal and Pakistan (FAOSTAT, 2020).

3.7.3 Fisheries products

Productivity across different water bodies in Bangladesh increased significantly. Productivity is highest in pond (4851 kg/ha), followed by baor (1471 kg/ha) and shrimp/ prawn farms (983 kg/ha) (Figure 19).

Figure 19: Productivity across different types of water bodies



The productivity growth rate is most pronounced in river and estuary (4.823% per annum) and ponds (4.669% per annum), implying that the country is doing well in increasing productivity at both closed and open water bodies (Table 15). But an issue of concern is that productivity under highly intensive cultural method during last couple of years is lower than that of earlier years.

Table 15: Annual average productivity growth rate across different water bodies (%)

Different water bodies	Whole period (2002-18)
River & estuary	4.823***
Beel	1.921***
Kaptai lake	1.738**
Flood plain	2.896***
Pond	4.733***
Baor	4.669***
Shrimp/prawn farm	2.748***

Source: Authors' calculation using data from Yearbook of Fisheries Statistics of Bangladesh
Note: The annual exponential growth rate is the parameter β in $^{\ln Y} = \alpha + \beta t$.

3.8 Drivers of diversification

While higher income, urbanization and the resulting shifts in consumption patterns are the commonly mentioned demand-driven drivers of diversification (Losch et al., 2011; Mwangi and Yu, 2015), the most dominant associated supply-side driver is profit, which is determined by output-input prices (Joshi et al., 2003; Benin et al., 2004; Rahman, 2016). But the appeal of relatively higher profits may fade away when there are high price and yield risks (Joshi et al., 2003) and perishability (Mwangi and Yu, 2015), since price volatility is more in case of fruits and vegetables compared to cereals (Subramanian, 2000). There are evidences that contract farming helped the farmers in South and Southeast Asia and Africa to neutralize such risks at least to some extent (Jayne et al. 2004; Minot, 2006; Gulati et al., 2007). Though it is expected that output prices are positively correlated with diversity, the alternative is also possible. For instance, Rahman (2016) observed jute and vegetable prices in Bangladesh are positively correlated with land use diversity, whereas lentil price has opposite relationship. This is because yield levels of pulses in Bangladesh are very low and hence fail to compete with other non-cereals, even when price rises.

In addition, there are a number of critical supply-side factors mentioned in the literature. Farmers who do diversify often choose to produce high-value crops and commodities that have high market demand (Ashfaq et al. 2008; Dorjee et al., 2003). Consequently, increased and eased access to markets promotes diversification. Rural infrastructure improvement such as building roads minimizes transportation costs and reduces post-harvest losses and contribute to diversification (Pingali and Rosegrant 1995; Rahman 2009; Joshi et al. 2003).

Technological changes such as irrigation and fertilizer also affect the decision to diversify. Increased share of irrigated land may decrease the likelihood of horticulture farming because irrigated land is typically assigned to rice production (Bhattacharyya, 2008). Horticultural crops competing with rice for resources are more commonly grown in rainfed areas with limited irrigated land (Joshi et al. 2003; Rao et al. 2015). Acharya et al. (2011) found that irrigation increases the number of crops grown (diversification) within each crop group for all categories except cereals. Access to fertilizer encourages diversification (Acharya et al., 2011; Bhattacharyya, 2008), whereas increase in fertilizer price reduces diversity (Rahman, 2016). Rahman (2016) found that agricultural land use diversity (i.e. farmers' crop choices) in Bangladesh, are significantly influenced by climatic factors and agro-ecology. Institutional factors such as increased R&D and extension expenditures contribute to diversity in the long-term (Rahman, 2016). Along with these, farm level physical, community and socio-economic characteristics significantly influences a farmer's crop choices (Benin et al., 2004). The drivers for some of the major cropping patterns in Bangladesh are listed below:

Major patterns	Drivers/Forces
Potato/Mustard - Boro (HYV) - T. Aman	Irrigation facility, maximizing profit, land suitability, access to market
Wheat - Kaon - T. Aman	Irrigation facility, maximizing profit, credit facility, land suitability
Pulses - Aus – Vegetables	Improving soil fertility, maximizing profit, access to market, balanced diet
Wheat - Aus - T. Aman/ Wheat–Jute–T. Aman	Irrigation facilities, credit facility maximizing profit, land suitability
Boro - T. Aman – Fallow	Land suitability, demand of cereal foods, improving sol fertility
Boro–Aus–T. Aman	Irrigation facilities, demand of cereal foods, land suitability
Maize-Fallow-T. Aman/ Maize-Potato-T. Aman	Market demand, demand of cereal foods, improving sol fertility

Modified from: Hoque (2001) and Nasim et al. (2017)

3.9 The nexus between agricultural diversification, productivity and nutritional security

Growth and development of the agricultural sector is crucial to escape poverty traps in many developing countries (World Bank, 2008). Within agriculture, one of the strategies suggested as a pathway to poverty alleviation is crop diversification (e.g., Birthal et al., 2006; FAO, 2011; Perz, 2004), which is considered as one of the most ecologically feasible, cost-effective, and easier way of reducing the effect of uncertainties, especially among small-scale farmers (Njeru, 2013). Many studies (e.g., Bravo-Ureta et al., 2006; Harris

& Orr, 2014; Oladele, 2011; Weinberger & Lumpkin, 2007) have analyzed the relation between crop diversification and poverty alleviation by investigating its contribution to rural incomes and creation of employment opportunities.

Table 16: Contribution of crop diversification to the achievement of the food security and nutrition related Sustainable Development Goals (SDGs)

SGD Goals	Type of benefit	Specific benefits of crop diversification
Goal 2: zero hunger & Goal 12: sustainable consumption	Nutrition and food security	-More diverse production systems may contribute to more diverse household diets; -Fruits and vegetables production is beneficial for food security, particularly for anaemia status of individuals (in particular, women of childbearing age); -Crop diversification also has a direct effect on food availability and nutrition.
Goal 12: sustainable production	Crop productivity	-Increases soil fertility; -Can improve productivity of the main crop and can increase yields in general; -Increases production and increases production stability; - Reduces the risk arising from seasonal factors.
Goal 12: sustainable production	Protection against pests and diseases	-Can improve resilience in a variety by engendering a greater ability to suppress pest outbreaks and dampen pathogen transmission; -Controls pests and diseases; -Provides habitats for beneficial insects, and this can help in reducing the number of pests by rendering host crops less apparent for colonisation by parasites.
Goal 12: sustainable production	Safety against market oscillations	-Reduces financial risk; -Mitigates price risk as well as fluctuations in outputs; - Crop diversity is a strategy for risk avoidance due to sharp fluctuations in crop yield or prices.

SGD Goals	Type of benefit	Specific benefits of crop diversification
Goal 13: climate action	Climate change mitigation, Climate change adaptation	-Reduces need for nitrogen fertiliser and consequently less greenhouse gas emissions. • Improves tolerance to drought and water-logging; • Key adaptation strategy for smallholder farmers under climate change; • Increases yield stability; • Can serve as insurance against rainfall variability as different crops are affected differently by climate events; • Relative differences in productivity between monocultures and polycultures become more accentuated as water stress increases; • Crop diversification can improve resilience by engendering a greater ability to suppress pest outbreaks and reduce pathogen transmission.

Source: Feliciano (2019)

4. Leading Issues Likely to Impact Agricultural Diversification and Rural Development

4.1 Rise of small farms and landless tenancy

Historically Bangladesh agriculture is dominated by small farms and their numbers have increased rapidly (Table 17). Meanwhile, the size of cultivated area per farm has decreased from 0.81 ha to 0.51 ha between 1984 and 2008 (FPMU, 2013). A classical debate in agricultural economics literature is related to productivity, efficiency, food security and technology adoption in small farm settings. While Schultz (1964) argued the small farmers to be 'poor but efficient', IFAD (2010), considered smallholder agriculture as a route of poverty for many people living in rural areas. According to the Food and Agriculture Organization (FAO), smallholder farmers produce much of the developing world's food supply but are generally much poorer than the rest of the population and less food secure than the urban poor (FAO, 2011). Crop diversification is considered as one viable option in small holder farming that can ensure establishment of resilient agricultural systems that can contribute significantly to household food security (Mango et al, 2018). In West Bengal, it was found that small and marginal farmers played a positive role in crop diversification, that has been supported by growth of various infrastructural network (De and Chattopadhyay, 2010). But Brithal et al. (2015) showed that though diversification has a positive impact on escaping poverty, but up to a threshold level probably because of constraints like capital on smaller farm and labor on large farm.

Table 17: Proportion of farm households belonging to different farm categories (%)

Farm categories	1983-84	1996	2008
Small farm (0.05-2.49 acres)	70.34	79.87	84.27
Medium farm (2.50-7.49)	24.72	17.61	14.19
Large farm (7.50 acres & above)	8.67	10.18	9.58

Source: BBS

Meanwhile, number of landless tenants in the country increased from 9.3% in 1988 to 17.7% in 2014, whereas their share in total cultivated land increased to 23.18% in 2014 from 6.7% in 1988 (Sen, 2018). While in 1988 less than one-fourth of the cultivated land (23.4%) was under tenancy in rural Bangladesh, in 2014 the share almost doubled (47.5%) (Hossain and Bayes, 2009; Sen, 2018). The rise in land rental market has equity effects and positive effect on tenants' poverty. Sen (2018) argued for several factors such as spread of education, expansion of salaried jobs, and urbanization (domestic migration) that will continue encouraging richer households to renting-out lands. But the concern remains whether crop diversification related technologies can be efficiently adopted in small farm settings and tenant operated lands. Moreover, reaping the economies of scale and size by these farmers as they have resource constraints will be a major challenge for Bangladesh in the coming days.

Contract farming in some context is argued as the best strategy for the small-holders since it is proved to be an effective strategy to profit-and-risk sharing in some parts of South and Southeast Asia (Gulati et al., 2007). For instance, in case of Vietnam, Minot (2006) observed that vertical coordination, such as contract farming, farmer associations, and market information sharing systems have eased some of the constraints related to horticulture crops and consequently enabled more farmers to participate in high-value crop production. Since interlocking input-credit-output transactions has worked in country like Kenya (Jayne et al. 2004), farmers' control over the bargaining process needed to be ensured. Moreover, policies to ensure smallholder farming households' access to credit, education, and input market are also argued in literature (Mango et al., 2018).

4.2 Preventing Land Loss from Agriculture

Satellite-based information showed that annual loss of agricultural land was 0.416% during 2000-2010, instead of the notion of 1% annual loss of agricultural land according to some less authentic sources of information. Regarding specific shift of agricultural land to non-agricultural use, it has been revealed that major shift occurred due to rural settlement, urbanization and industrialization. The annual rate of increase in rural settlement was 0.208% during 2000-2010 period. The annual gain of urbanization and industrialization was estimated at 4012 hectares during this period (Hassan et. al., 2013). The main concern is that rural settlement and urbanization has been occurring in unplanned manner. Thus, there is an urgent need of land zoning so that rural settlement and industrialization do not occur indiscriminately, particularly in lands better suitable for agricultural purpose.

4.3 Yield gap minimization

In Bangladesh, the productivity of rice and other crops is low and there are large yield gaps between farmers' fields and research trials. The same is true for other agricultural commodities such as fisheries and livestock sector. Despite major technological shifts from

low-yielding to high yielding and irrigation-based rice cultivation (Baffes and Gautam: 2001), the yield gap for different crops (e.g. rice, wheat, potato, oilseeds, pulses, etc.) range from 19% to about 64% of the potential yield (Alam, 2006; OFRD, 2003-04a, 2003-04b & 2008-09; Roy, 1997; Matin et al., 1996). The high yield gaps have significant implications on farm production and profit, food security and ultimately, agricultural GDP. In this context, with the financial help from the World Bank, government initiated the National Agricultural Technology Project (NATP) to disseminate different rice yield gap minimization technologies, which is perhaps the largest initiative to minimize the existing yield gap. The project claims minimizing yield gaps in the demonstration plots by 1.05 t/ha (through 25% yield increase over conventional farmer practices), 1.20 t/ha (22% yield increase) and 0.61 t/ha (17% yield increase) for T. Aman, Boro and Aus season respectively (NATP, 2012). But the widespread adoption of the technologies remains concern, particularly when the extension service in the country is continuously criticized for being inefficient.

4.4 Increasing women participation in farming

Globally women have an increasing participation trend in agriculture and Bangladesh is no exception where more than half of the total agricultural labour force are women, and their participation is gradually increasing (Jaim, 2011). Although some literature suggests that productivity of men and women in agriculture is same (e.g., Quisumbing, 1996; Croppensteld et al., 2013), others attribute gender-based differences in productivity due to unequal access to resources and other constraints specific to women (e.g., Aguilar et al., 2015; Kilic et al., 2015). Literature examining the role of women and gender gap in empowerment on agricultural productivity has mixed conclusions. Seymour (2017) noted that a reduction in gender gap in empowerment significantly improves production efficiency in Bangladesh agriculture, whereas Mishra et al. (2017) observed that women headed farm households in the Philippines are less efficient and earn less profit, though the value of rice produced is higher in women headed farms and they are more likely to adopt modern seed varieties. Beyond the domain of productivity and efficiency, greater women participation contributed positively to farm-land preservation, as in Japan (Takayama et al., 2018). Some specific concerns related to women participation in agriculture are:

- Wage differences between male and female in agriculture;
- Socio-economic backwardness and constraints that women endure in a male dominated society;
- Women's access to institutions and facilities including extension and credit services
- Women's access to markets and value-addition in agriculture; and
- While women cannot compromise their regular household and family duties, increased participation and responsibility in agriculture may have negative implications on their child's health and leisure activities.

4.5 Changing climate and degrading natural resource base

Bangladesh is ranked seventh among the countries most affected by extreme weather events during the last two decades (Eckstein et al. 2019). Future climatic variability and its associated events are predicted to have more adverse effect on agriculture and living

standards of the citizens, particularly for those who are poor and earn livelihood from agriculture and the effect can vary across regions (World Bank 2018). Many literature has explored influences of climatic change and associated anomalies on Bangladesh agriculture (e.g. Mahmood 1998; Paul 1998; Ali 1999; Rashid and Islam 2007; Sarker et al. 2012).

Besides, the country's natural resource base is low, and it is further downgrading. The soil fertility in the country is low to medium, particularly organic material content is mainly low. Nitrogen and phosphorus deficiency in soil has been reported since the mid of previous century. Recently, Mg, B, and Mo deficiencies are reported for some crops and soils. It has been predicted that rice production could fall by 8% as early as in 2050 because of imbalanced nutrients using solely inorganic fertilizers. At present, nitrogen constitutes about 75% of total fertilizer nutrients used in Bangladesh. Such excess nitrogen use may enhance mineralization of organic matter which may decrease carbon content in soil and increase CO2 emission. Overuse of N enhances its loss as NO3- leaching, NH3 volatilization and denitrification as N2O and NO. Here it is noteworthy mentioning that since 2008-09 Bangladesh government is balancing urea and non-urea fertilizer subsidy which gradually raised urea price, whereas price of TSP, MoP and DAP reduced and consequently urea sales reduced and the use of other three fertilizers increased (Table 18).

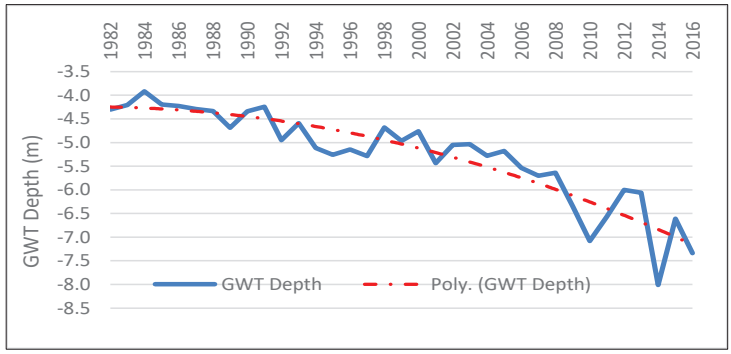
Table 18: Fertilizer price and sales over the year

	Price (tk/kg)				Sales (lakh MT)			
Period	Urea	TSP	MoP	DAP	Urea	TSP	MoP	DAP
2008-09	6	28	26	36	25.33	1.65	0.82	0.16
2009-10	12	80	70	90	24.09	0.42	2.63	1.36
2010-11	12	22	15	27	26.55	5.91	5.07	3.53
2011-12	20	22	16	27	22.96	6.41	6.03	4.03
2012-13	20	22	15	27	22.47	6.54	5.71	4.34
2013-14	16	22	15	27	22.13	6.12	4.51	5.21
2014-15	16	22	15	25	26.38	7.22	6.4	5.97
2015-16	16	22	15	25	22.91	7.30	7.27	6.58
2016-17	16	22	15	25	23.66	7.40	7.81	6.09
2017-18	16	22	15	25	24.28	7.02	7.89	6.90
2018-19	16	22	15	25	25.94	7.81	7.24	7.63
2019-20	16	22	15	16	26.50	7.50	8.50	9.00

Source: Bangladesh Economic Review 2020, Ministry of Finance, Government of Bangladesh.

Water use in agriculture is critical from environmental perspective, as the sector alone consumes 70-80% of the total fresh water. The groundwater table in the northern districts dropped to 7.6 meter in 2016, compared to 6.6 meter in 2015 (Figure 20). The irrigation efficiency in Bangladesh is very low, 30-40%, implying around one-third of the water is wasted. Along with several other reasons, the conventional irrigation pricing system where farmers pay area based fixed charges, has a role behind inefficiency. Such a pricing system, which is uncorrelated with the volume used, results in inefficient and wasteful use of water. Volumetric water pricing is practiced in Barind Multipurpose Development Authority (BMDA) areas and in some Bangladesh Agricultural Development Corporation (BADC) areas. In this arrangement, a farmer can minimize irrigation cost by reducing water consumption. The farmer may also feel encouraged for crop diversification, since compared to paddy, other crops require less water.

Figure 20: Groundwater table depth in Northern Bangladesh



Source: FPMU Food Security Monitoring Report, Ministry of Food

4.6 Changing consumption pattern and future demand

Population growth, economic growth and increased education are the three important determinants for changing consumption pattern and food demand. With economic development and increased education, people are expected to shift from cereal-based consumption pattern to more diversified ones. Due to economic factors, demand for animal and fisheries products are likely to increase more than other products, whereas population growth will be the major driver for cereal demand. Annually the country has to increase rice production by over 300,000 tons to feed the country's additional population which is increasing by about 1.7 million per year (GED, 2019). Table 19 shows that for most of the crops Bangladesh is predicted to have surplus production. The exceptions are wheat, pulses and vegetables for which the country needs to rely on import. Since economic growth is expected to outpace population growth, meeting diversified demand through diversifying production portfolio at the farm level will be a major issue. It has been estimated that if GDP grows at 7% per annum, demand for food crops in Bangladesh will increase by 3.1% per annum. Institutional issues like extension and credit and linking farmers with the market are of upmost challenges (GED, 2019).

Table 19: Projection of demand and domestic production of major food items in 2025 (m metric tons)

Year	Demand	Domestic production	Surplus (+)/ deficit (-)
Rice	36.55	37.95	1.4
Wheat	4.05	1.45	-2.6
Maize	2.5	2.7	0.2
Potato	10	10.1	0.1
Pulses	1.1	0.36	-0.74
Vegetables	6.85	5.9	-0.95
Fruits	3.45	3.65	0.2
Meat	1.7	1.8	0.1
Egg	0.2	0.35	0.15
Milk	3.75	4.05	0.3
Freshwater fish	4	4.1	0.1

Source: GED, 2019

4.7 Institutional bottlenecks in research-extension-farmer linkage

The undisputed role of agricultural R&D investment for increasing agricultural productivity and growth is well documented in the literature (Coelli et al., 2003; Rahman and Salim, 2013). But the budget allocation for agriculture is limited in Bangladesh. The extension service positioned in the middle of the research-extension-farmer trio receives limited budget of which the lion's share (84 %) is spent as salaries of extension staff and only a marginal share (1.5 %) is available for extension programmes (e.g. training, demonstrations, etc.) (Birner et al., 2010). A Sub-Assistant Agricultural Officer (SAAO) is required to serve on an average of 1162 farm holdings, which is an impossible target to have any positive impact (BBS, 2019; DAE, 2017). Such constraints hinder performances of agricultural institutions which ultimately has implications on performance and growth of the sector (Bategeka et al., 2013).

Globally government extension service is increasingly criticized for being inefficient and through using ICT many of its limitations can be overcome. In Bangladesh several such apps are available [8], though their actual status of use is unknown.

4.8 Losing agricultural land

With increasing population and economic growth, demand for land outside agriculture is increasing and agricultural land is diverted to non-agricultural uses. Climatic and environmental factors such as water logging, depletion of ground water and soil fertility, erosion, and salinity also contribute in the process. For instance, in the southern region, about 170,000 ha of agricultural land has been degraded in the last three decades by increased salinity (MoA and FAO, 2011). Riverbank erosion accounts for about 40% of land loss on about 1,200 km of riverbanks (primarily the Ganges, Jamuna, and Padma rivers) that are seriously affected as topsoil is washed away and replaced by sand.

4.9 Storage, agro-processing and commercialization

Farmers' access to storage, agro-processing and value chain is critical for diversification. Low product price during harvest is always a concern for farmers, particularly for those who are poor. The limited available storage facility also raises quality concerns. Both quantitative and qualitative food losses of extremely variable magnitude occur at all stages in the post-harvest system from harvesting, through handling, storage, processing and marketing to final delivery to the consumer. Post-harvest loss results not only in the loss of the actual crop, but also losses in the environment, resources, labor needed to produce the crop and livelihood of individuals involved in the production process.

5. Strategies for Enhancing Agricultural Diversification and Raising Productivity during the 8th FYP

General Principles

1. The overall strategy for the 8th FYP will be to promote agricultural productivity and diversification to ensure food security and enhance farm profit while confirming sustainability of the agricultural system. The strategy requires transformation from semi-subsistence farming to commercialization of agriculture. As diversification may require releasing paddy land to other high value crops and enterprises, raising productivity and linking farmers with the market are the two key strategies here.

8 A list of some such apps is available at the official web page of DAE (http://www.dae.gov.bd/).

2. Ensuring productivity gain requires strong education-research-extension-farmer linkages. Increased agricultural spending for research and extension supports is the prime need to boost this linkage. Research should focus on developing new crops and varieties that has higher productivity, particularly for the climate stressed areas. Initiatives are needed for cropping pattern changes so that farmers can fit non-rice crops in their existing paddy-based cropping pattern. Beyond the conventional extension approach, ICT based approaches should be emphasized. Strategies are also required for ensuring institutional access of all categories of farmers, particularly to credit and extension facilities.
3. Market potential is the key driver for diversification, which will further boost the commercialization process. Linking the farmers, particularly the smallholders and landless tenants with the domestic and international market is the challenge here. The process requires enhancing farmers' bargaining capacity in the market through various forms of contract farming, reduced transaction cost and safeguarding against yield and price risks, through forming farmers' organizations and cooperative marketing where applicable. Department of Agricultural Marketing (DAM), Department of Agricultural Extension (DAE) and other agricultural organizations has a key role to monitor against any forms of market distortions. But it has to be kept in mind that, Bangladesh operates in the framework of market economy where the government's role should be to monitor and intervein (e.g. procurement program, creating storage facilities, etc.) only when market failure has welfare implications.
4. While the numbers of small farmers and landless tenants are increasing in Bangladesh, average farm size is shrinking, in parallel, an entrepreneur group is in the rise. Agricultural marketing and agribusiness related research and interventions must be strengthened to support this process of agricultural transformation for both the groups. The agricultural research and extension service institutes should recognize the need of the entrepreneurs. The agricultural educational institutes (both universities and training institutes) need updating their curriculum on regular basis so that graduates and trainees get both technical and managerial knowledge. Their access to institutional finance at low transaction cost and shortage facilities needed to be ensured. For linking these entrepreneurs with the export market, Bangladesh missions abroad need to play a proactive role for reducing trade and non-trade related barriers. Quality and health issue of the products are key to enter and sustain in the international market, and different government institutes including research organizations, DAE, Hortex foundation and related government ministries have to play the facilitating and monitoring role here.
5. In the process of productivity gain and commercialization, sustainability of the agricultural system through rational use of natural resource base has to be at the core. Market based Economic and Policy Instruments (EPI) which offers direct incentives to the farmers to improve the provision of ecosystem services need to be emphasized. Subsidy policies need to be designed in a way that while ensuring food-security and livelihood of the farmers, the policies can contribute in reducing environmental consequences. For instances, while continuing the fertilizer subsidy balancing process, DAM, DAE or Hortex foundation may facilitate contract farming to establish separate marketing channels for the organic farms, initially targeting the consumers of the metropolitan cities, so the growers can enjoy some price premium. Special attention and programs are needed for environmentally stressed ecologies such as hilly regions, haor, charland, the coastal zone and Barind areas. Indigenous people moving out of the *jhum* cultivation may be compensated under ecosystem payment services, though the details needed to be designed.

6. Given the increasing dominant role of women in agriculture, women empowerment and reducing gender-gap will be more and more critical in agricultural diversification and growth. The available subsidy schemes are gender blind, but in reality, the male enjoys the benefit since he has the property right and it is customary for male to do transactions, though in reality women may do the farming. Introduction of family agricultural cards may help here. The researchers and extension workers need to make sure that technologies and their dissemination process are gender sensitive.
7. As a cross-cutting agenda, agricultural credit policy in line with the Agricultural & Rural credit Policy and Program that has been developed for the FY 2017-2018 and FY 2018-2019, needed to be further developed.
8. Human capital development is another critical area for development and diversification. The personnel in research and extension organizations along with universities need to be supported for higher education and training. A certain portion of the DAE budget should be allotted for farmers' training and there must be regular allocation provision in the national budget. Given the existing work burden for the DAE and limited field level facilities for the DLS and MoF, to make extension program more effective, strategies should be taken for wide application of ICT in agricultural extension. Farmers should be provided with suggestions related to their regular farming activities, updated price and weather information. Information can be provided through TV, community radio and cell phones along with extensive use of the services of the Bangladesh Space Research and Remote Sensing Organization (SPARRSO) in weather forecasting. The very low level of ASTI related expenditure should be increased at least to 2% of the total agricultural value added.
9. Good governance should be a key strategy for the agricultural sector. Though agriculture sector ranks low in Bangladesh when proportion of household experiencing corruption is considered, 41.6% of the households in the sector reported experiencing corruption (TIB, 2018). In the process of ensuring good governance, introduction of grievance redress mechanism and effective implementation of Citizen's Charters is required. Automation of service delivery system and use of ICT will help in easing out corruption ensuring transparency.
10. Regarding shift of land within crop agriculture, it has been observed that although crop diversification has increased over the past years, it is not up to expectation and needs to be strengthened further. This can occur by releasing some rice land to non-rice high value crops, without compromising rice self-sufficiency through intensification of rice production in line with use of more high yielding varieties of rice and better cultural practices. The phenomenal rise in the use of land for aquaculture has contributed to agricultural diversification. However, some regulations have to be in place for preventing conversion of fertile lands for aquaculture expansion. Special care also has to be taken to prevent conversion of rice lands and mangrove forests to shrimp culture in the coastal areas of Bangladesh. For detailed planning and successful implementation of the land zoning, active participation of the DAE, local administration and community is required.

Crop Sub-sector

Sustainable agriculture and green growth: Sustainability does not only have biophysical dimension, which relates to use, preservation and enhancement of the long-term productivity

of the resource base, but also has economic and social dimensions (Herdt and Lynam, 1992). An effective sustainable agricultural system must be built on current agricultural achievements and resource base and needs to be flexible to adopt sophisticated approach that can maintain high yields and farm profits without undermining the natural resource base. In earlier plan documents and other policy documents several tools and strategies such as organic farming, Integrated Pest Management (IPM), Alternative Wetting and Drying (AWD) and others were identified and recommended. For successful adoption of these the plan documents stressed coordination and combined actions from different government ministries and agencies including Ministry of Agriculture (MoA), Ministry of Environment and Forest (MoEF), Ministry of Land and Ministry of Water Resources. But the actual adoption status of these have not reached the desired level. To offer farmers some benefit to adopt these environment friendly technologies, EPI for ecosystem payment can be designed. For instance, compared to conventional urea, granular urea is less polluting and ensures higher productivity. To make it more popular government may discriminate between the two forms of urea and provide more subsidy to granular urea so that its price is lower than the conventional one and farmers are encouraged to use it.

Ensuring production of enough staples and diversifying the non-crop sector: In line with the previous two plan documents, the 8th FYP should concentrate on maintaining self-sufficiency in the major staple production through ensuring required increase (@ 300,000 tonnes per annum) and simultaneously diversifying the production portfolio within and beyond the crop sector so that diversified foods are produced to meet the nutritional requirement for the country's growing population in a sustainable manner by covering people living in different agroecological zones.

The strategy requires research for area specific modern variety development and increasing productivity. The NARS institutes and agricultural universities need to play big role in inventing relevant new technologies. The DAE will be responsible for farm level dissemination of the new technologies. The MoA has to play the leading role for proper coordination among different ministries. In case of rice, a short growing Aus rice variety to avoid climatic uncertainty during late summer is of upmost importance. Strategies are also needed for minimizing yield gap through farm level appropriate technologies.

More attention is needed for crop intensification in environmentally and economically vulnerable areas such as the coastal zone, the Sylhet region and the char areas in the northern poverty-stricken districts. Another strategy should be to encourage farmers to devote ecologically favorable months of Boro season for growing high return non-rice crops leaving the remaining eight months for growing two rice crops, Aman in particular.

Given the subsistence or semi-subsistence behavioral pattern (i.e. prioritizing household's food security) that is common among the farmers, interventions should be wisely planned to direct changes in cropping patterns so that farmers can cultivate the non-rice crop as third crop along with Aman and Boro paddy. For instance, in the middle-part of the country Aman rice is harvested in December and Boro rice transplanting starts in February. The time in between is not sufficient to grow a third crop. Replacing traditional Aman rice varieties with short duration varieties would allow farmers to grow a short season crop between the Aman and Boro rice crops. AEZ specific such plans should be designed.

Ensuring optimal use of water resources: Crop diversification is an effective tool for lessening groundwater extraction, as compared to paddy water requirement for other crops is much lower. For ensuring irrigation efficiency, technologies that enhances conveyance

efficiency (e.g. buried pipe, PVC/plastic/polythene pipe, etc.) and on-farm water use efficiency (e.g. drip irrigation, fertigation through drip irrigation system for the non-cereal crops, etc.) need to be promoted through extension. As some of these technologies (e.g. drip irrigation) are capital intensive, some entrepreneurs may require credit support. As in BMDA areas, volumetric water pricing that offers incentives to the farmers to rationalize water use can be promoted in areas under deep-tube wells. Tiered pricing, setting lowest price at suitably determined threshold level of water use, will further encourage farmers in the Barind areas to rationalize water use.

Rational use of quality inputs: In Bangladesh, larger portion of the total agronomic requirements of seeds comes from informal sources. BADC, DAE and other government agencies need to enhance their capability for producing more seeds. Their distribution channels also needed to be improved so that farmers can access at lower transaction cost. Women has an important role here since they are extensively involved in seed preserve and management practices. Government's policy of rebalancing fertilizer subsidy in favor of non-urea fertilizers needed to be continued since this has generated some success in balanced use of fertilizers. Through motivating farmers towards balanced use of fertilizer, extension service can play an important role here. Furthermore, strategies for extensive production and use of organic/bio fertilizer, and proper utilization of soil guide and soil testing facilities needed to be made available.

Promote measures to expand mechanization and value chain development: Increased agricultural wage particularly during the harvesting season has become a major concern in recent days. Agricultural mechanization in this regard needs to be promoted since it boosts productivity, reduces cost and contribute to farm efficiency. Strategies including credit and technical support will be developed to support the local machinery producers. Collaborative efforts are needed by public and private sectors in technology development and its diffusion. Technological progress needs to be supported by public and private investment for irrigation, flood control and drainage, and farm mechanization, especially expansion of power tiller for land tilling, power threshing and processing as well as milling. In line with the suggestions made in the national agricultural policies like promotion of mechanization through cash incentives for selected machineries at producer, manufacturer and farmer levels should continue.

Land reform: Land reform has its implications beyond agriculture as it balances the power structure, both economic and political. It empowers the actual tillers of the soil, and organizes and enables them to seek development benefits from the state. Access to land is necessary for encouraging investment and improvement in land (EU, 2004), which ultimately contributes in productivity (FAO, 2005; Place, 2009). But the process requires strong political will and motivation and challenging for the policy makers since they do require some trade-offs in growth and equity objectives (Place, 2009). The increasing agricultural land market has already created some equity benefits for the tenants in the country (Sen, 2018). To further facilitate the process strategies are needed to safeguard against eviction of the tenants and granting them the right of pre-emption in land transfer. The government khas land need to be distributed to the landless and the marginal farmers. Automation of land records and transfer will further reduce the associated transaction costs and anomalies.

Promoting urban agriculture: rooftop and vertical farming: Urban agriculture may promote food security through income generation. It is also a source of safe food for

the urban people for whom conventional farming is not possible. Urban agriculture also contributes in environmental sustainability, as it is less input intensive. But controversies remain in supply-water use for rooftop gardening and hence use of underground water may be discouraged. For increasing productivity in urban agriculture, agricultural technology innovation is required to ensure sustainability of production. Research is also needed for efficient fertilization technology and eradication of plant pests and diseases. Technological innovation and dissemination is also needed for the postharvest technology. Finally, strategies are needed to link urban farming products with the value chain.

Fisheries Sub-sector

Culture fisheries: Culture fisheries being the major source of fisheries growth in the country, further intensification in pond aquaculture and brackish water shrimp culture is required to meet the growing demand in the country. Two important considerations in the process should be sustainability (environmentally, socially and economically compatible) and quality (improved traceability for compliance). Particularly safeguarding mechanism against the livelihood effect of shrimp culture on the landless and marginal farmers needed to be ensured.

Supply of quality fingerlings and fish feeds through private sector will remain an important strategy. Promoting small indigenous species in conjunction with pond carp culture will be an important strategy from the viewpoint of nutrition for the poor.

The BFRI needs to work for new variety and technology development, and provide technical support to DoF, who will do the field level dissemination. But while developing new varieties along with productivity, the issue of taste needs to be considered.

Capture fisheries: Productivity under open water capture fisheries has been mostly stagnant for several reasons including: depletion of stock, encroachment of water bodies due to developmental works and water quality deterioration.

Involving local community is critical in addressing issues like pollution and replenishment of stocks. Cage culture in the flood plains and in rivers, with individual ownership can certainly contribute to productivity.

Livestock and Poultry

Developing good quality breed: Bangladesh has one of the highest livestock density in the world, where the growth in animal population largely comes from commercial poultry and small ruminants. But the productivity of local breeds is very low. Breed development through crossbreeding local variety with suitable exotic variety with follow-up management practices should be of upmost priority. For backyard farming, where investment potential is limited, local breeds that have relatively higher productivity and hardy in nature can be promoted.

Improving management practice: Better management practices such as quality assurance of feed stuff including water, disease and pest control, hygienic processing of products and environmentally safe disposal of wastes are important strategies. These also have implication on food safety. The DLS has a role in developing human capital through training on appropriate feed mixture, vaccination and adherence to bio-security guidelines.

Supply of quality day-old chicks is important for small scale commercial poultry farms. The strategy should be to address the main determinants of production, namely ensuring that animals are disease free; well fed with cost effective and balanced forms of animal feed. Introduction of insurance schemes, at least in the commercial farms, should also be an important consideration. Veterinary and extension service is critical for livestock farming, though the DLS offices do not exist beyond upazila level. The lead farmer approach can be continued with more training and incentives for the farmers.

Government institutions have an important role to play. For instance, while BLRI ensures breeding services at farmer's level and also for commercial entities, DLS has to monitor and provide technical support to feed mills at regional and local levels. For the feed industry, research is needed so that local ingredients and food additives can be produced locally using food waste (e.g. waste of fruits and vegetables). As an institutional safeguard mechanism, insurance at least for the commercial farms can be introduced.

Agroforestry

Expanding forest areas by controlling deforestation: The necessity of a separate agroforestry policy in Bangladesh is argued for some time by the professionals. Many of the neighboring countries of Bangladesh including India, Nepal and Bhutan has agroforestry policy. Given the limited natural forest area in the country, restrictive policies and regulatory framework for preserving and expanding agroforestry involving individuals and local community need to be intensified. Through such participatory process ecosystem-based specie selection and areas allocation for agroforestry practices needed to be done. Some of such practices available in the country are: community forest management, multilateral participatory management practices, and social forestry. For the delay in return from agroforestry, which often discourages farmers to practice agroforestry, farmers may be compensated, as was done in China under the 'Grain for Green' policy.

Special attention will be given in designing and allocating of funds for coastal forest management, along with polder and embankment management. But the success here largely depends on coordinated activities between Bangladesh Forest Research Institute (BFRI), Local Government and the Ministry of Land, where the Ministry of Environment and Forest will play the lead role.

6. Review of Current Food Security Situation

6.1 Food Availability

6.1.1 Availability of foodgrain

Bangladesh has made remarkable progress in domestic food production over last four decades. Table 20 shows that net domestic foodgrain production almost doubled during the last two decades. Aggregate availability of foodgrain more than doubled during the period. Per capita availability almost persistently increased during the period. Table 20 shows that per capita availability of foodgrains increased from 419 grams per day in 1996-97 to 687 grams per day in 2019-20. Separate figures for rice and wheat have not been shown because rice constitutes overwhelmingly larger share in the foodgrains. Calculation of shares of gross production has shown that rice constituted 92.8% of gross production of foodgrains in 1996-97 which increased to 97.5% in 2018-19.

6.1.2 Availability of Other Foods

Table 21 shows domestic and per capita availability of non-cereal foods. It is clear from the Table that for almost all the food items both aggregate production and per capita availability increased substantially between 2004-05 and 2017-18 period. Increase of domestic production of potato, vegetables fruits and fish look consistent. However drastic fall in the production of pulses and rapid increase in the production of meat and milk from 2010-11 to 2017-18 is difficult to be explained. Per capita availability of fruits and vegetables consistently increased and reached 168 grams per day against the normative requirement of 100 grams per day [9].

Bangladesh, in fact, is surplus producer of two food items: rice and potato. Per capita availability of fruits and vegetables consistently increased during the period from 2004-05 to 2017-18. However as in the case of domestic production, drastic fall in the per capita availability of pulses and rapid increase in the per capita availability of meat and milk is difficult to be accounted for. Per capita availability of pulses, fruits and vegetables fall far short of requirement.

Table 20: Foodgrains (rice and wheat) production and availability in Bangladesh

FY	Net domestic production ('000 m.ton)	Private import ('000 m.ton)	Public distribution ('000 m.ton)	Internal procurement ('000 m.ton)	National availability ('000 m.ton)	Public distribution as % of total availability ('000 m.ton)	Per capita availability (gram/day)
1	2	3	4	5	6=2+3+4-5	7=4/6*100	8
1996-97	17896	222	1392	721	18789	7.41	419
1997-98	18185	142	1621	467	19481	8.32	427
1998-99	19195	820	2134	519	21630	9.87	467
1999-00	21918	806	1900	1050	23574	8.06	501
2000-01	23548	534	1774	1133	24723	7.18	517
2001-02	22796	1171	1464	959	24472	5.98	504
2002-03	23491	1414	1423	712	25616	5.56	520
2003-04	24149	1684	975	843	25965	3.75	517
2004-05	22997	1785	1367	899	25250	5.41	495
2005-06	23994	1767	1245	945	26061	4.78	504
2006-07	24688	1514	1480	1140	26543	5.58	510
2007-08	26202	1235	1561	267	28732	5.43	544
2008-09	28306	2030	2128	761	31703	6.71	593
2009-10	29179	2863	1962	792	33212	5.91	613
2010-11	30371	2818	2293	463	35019	6.55	638
2011-12	30685	1180	2095	1156	32804	6.39	590
2012-13	30877	1393	2086	1405	32952	6.33	586
2013-14	31378	1765	2220	1438	33925	6.54	596
2014-15	31731	3450	1838	1676	35343	5.20	613
2015-16	31731	3950	2064	1232	36513	5.65	625
2016-17	30900	5298	2241	1384	37056	6.05	627
2017-18	32891	5376	2117	1435	38949	5.44	652
2018-19	32919	5155	2594	2377	38291	6.77	634
2019-20	33080	6002	2777	1872	43731	4.28	687

Note: 1. Net production is estimated after 12% deduction for seed, feed, waste etc.
2. Population figures are obtained from BBS projection.
Source: FPMU: Database on Food Situation, Ministry of Food.

9 The normative requirement figures have been obtained from Nahar, Q (2013). Desirable Dietary Pattern. BIRDEM/ NFPCSP-FAO, FPMU, Ministry of Food.

Table 21: Production and availability of other food items

Food Items	Production (million tons)			Availability (gm/capita/day)		
	2004-05	2010-11	2017-18	2004-05	2010-11	2017-18
Potato	5.95	8.30	9.74	108	153	168
Pulses	0.31	0.72	0.39	10	13	7
Oilseed	0.56	0.84	0.92	10	15	16
Vegetables	1.88	3.07	4.07	35	57	70
Fruits	4.6	3.56	4.51	68	65	78
Fish	2.1	2.89	4.28	41	53	74
Meat	1.06	1.90	7.21	21	35	125
Milk	2.14	2.95	9.40	42	55	162

Source: BBS, DLS, DOF

6.1.3 Sources of Availability

Obviously domestic production constituted the overwhelming share availability of foodgrains in the country. However, although domestic production of foodgrains rapidly increased over the past decades, leading to surplus situation, private import, which fluctuated widely, constituted significant part of availability for some years during the period under review. It would be evident from Table 20 that private import constituted 16% of availability of foodgrains in 2017-18. Public distribution of foodgrains which includes public import was another important source of availability. Table 20 shows that public distribution constituted about 6% of aggregate availability of foodgrains during the period under review. Among the other food items including potato, fruits, vegetables, fish and meat, domestic production constituted the major source of availability (Table 21). Bangladesh has long been dependent on import of pulses and oilseeds (edible oil) and domestic production constitutes smaller share in the availability of these food items.

6.2 Access to Food

Access to food has three dimensions- economic, physical and social. Economic access largely depends on income, price and the resultant purchasing power. Lack of purchasing power inhibits access to food of the poor people. The head count rate provides the estimate on the percentage of people living below the poverty line. Peoples' access to food may also be physically constrained due to breakdown of transport and other communication infrastructures as a result of severe natural disasters. Social and political unrest can also disrupt smooth supply of food to some specific locations.

6.2.1 Poverty Profiles and Access to Food

National level changes in the poverty rates are shown in Table 22 and Figure 21. It is observed that upper line poverty rates declined from 56.6% in 1991-92 to 24.3% in 2016, a reduction of 32.3 percentage points. With respect to the lower poverty line, poverty rates decreased from 41.0% in 1991-92 to 12.9% in 2016, a decline of 28.1 percentage points. It would be important to note that the annual rate of decline in upper line poverty during the 2000-2016 period was much faster (1.5 percentage points) than that during the 1992-2000 period (0.96 percentage points).

Table 22: Head count rate of incidence of poverty, 1992 to 2016 (CBN method)

Residence	Upper poverty line						Lower poverty line					
	2016	2010	2005	2000	95-96	91-92	2016	2010	2005	2000	95-96	91-92
National	24.3	31.5	40.0	48.9	50.1	56.6	12.9	17.6	25.1	34.3	35.1	41.0
Rural	26.4	35.2	43.8	52.3	54.5	58.7	14.9	21.1	28.6	37.9	39.4	43.7
Urban	18.9	21.3	28.4	35.2	27.8	42.7	7.6	7.7	14.6	20.0	13.7	23.6

Source: HIES 2005, 2010 and 2016

Table 22 also shows changes in poverty by rural-urban locations. In general, poverty rates were lower in urban than in rural areas. In the upper line category, rural poverty rates declined from 58.7% in1991-92 to 26.4% in 2016, an annual decline by 1.34 percentage points. During the same period, urban poverty decreased from 42.7% in 1991-92 to 18.9% in 2016, an annual decrease by just 1.0 percentage points. Thus the rate of decline in poverty rate was faster in rural than in urban areas. In the lower poverty line, the annual decline in rural and urban poverty rates were 1.2 and 0.66 percentage points respectively. Thus in the lower poverty line also, the annual decline in poverty rates were faster in rural than in urban areas.

6.2.2 Regional Differences in the Poverty Rates

The head count rate of incidence poverty by eight administrative Divisions is presented in Table 23. The estimates using upper poverty line in HIES 2016 showed that Rangpur Division had the highest incidence of poverty at 47.2%, followed by Mymensingh, Rajshahi and Khulna Divisions having poverty rates of 32.8%, 28.9% and 27.5% respectively.

Figure 21: Percentage of population under national poverty lines

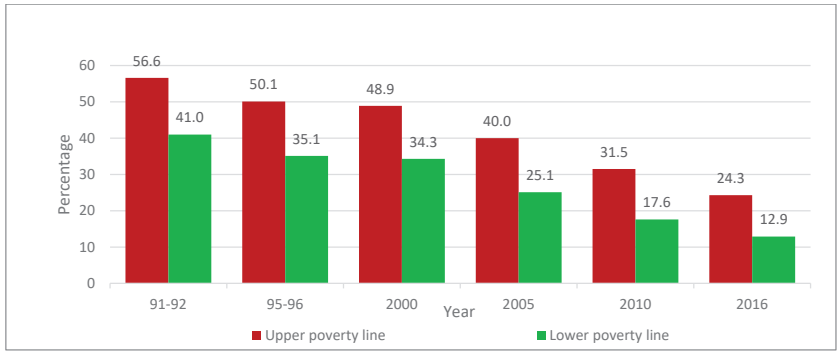


Table 23: Regional differences in poverty measured by CBN method

Region/ Division	Percent of population below poverty line							
	Upper poverty line				Lower poverty line			
	2016	2010	2005	2000	2016	2010	2005	2000
National	24.3	31.5	40.0	48.9	12.9	17.6	25.1	34.3
Barisal	26.5	39.4	52.0	53.1	14.5	26.7	35.6	34.7
Chittagong	18.4	26.2	34.0	45.7	8.7	13.1	16.1	27.5
Dhaka	16.0	30.5	32.0	46.7	7.2	15.6	19.9	34.5
Khulna	27.5	32.1	45.7	45.1	12.4	15.4	31.6	32.3
Mymensingh	32.8	-	-	-	17.6	-	-	-
Rajshahi	28.9	29.8	51.7	56.7	14.2	21.6	34.5	42.7
Rangpur	47.2	42.3	-	-	30.5	27.7	-	-
Sylhet	16.2	28.1	33.8	42.4	11.5	20.7	20.8	26.7

Source: HIES Reports, BBS 2016, 2010, 2000

On the other hand, Dhaka Division had the lowest rate of poverty at 16.0%, followed by Sylhet and Chittagong Divisions having poverty rates of 16.2% and 18.4% respectively. In the lower poverty line criteria, again Rangpur had the highest incidence of poverty at 30.5%, followed by Mymensingh and Barisal Divisions having poverty levels of 17.6% and 14.5% respectively. Table 23 also shows that the percentage declines in poverty over the last decade (from 2005 to 2016) were most rapid in Dhaka and Chittagong Divisions. It is interesting to note that both upper and lower line poverty incidence increased in Rangpur Division during the 2005-2016 period. This implies that in the poverty analysis and in the case of possible interventions, regional aspects should be seriously taken into consideration.

In the HIES 2010, it was reported that incidence of poverty was higher for male headed household (3.1%) than for the female headed households (26.6%). Interestingly, this was also the case in the HIES 2016. Poverty rates were 24.8% and 19.9% in the male headed and female headed households respectively. This may be attributed to migration (internal and overseas) of male members and remittance sent by them for use by the female members who were left behind.

6.2.3 Social Access to Food

The government has been spending increasing amount of money through social safety net programmes (SSNPs) to improve food security of the poor people. Social safety net spending was successively increased from Tk. 21,975 crore in 2011-12 to Tk. 26,654 crore in 2013-14 and to Tk. 64.404 crore in the revised budget of 2018-19. In the proposed budget of 2019-20, the allocation has been raised to Tk. 74.369 crore. Safety net allocation as percent of national budget decreased from 13.63% in 2011-12 to 12.33% in 2013-14. However, the proportion increased to 14.55% in the revised budget of 2018-19. Also, safety net spending as percent of GDP decreased from 2.40% in 2011-12 to 2.54% in 2018-19. According to HIES 2016 Report, 27.8% households received safety net benefits during previous 12 months compared to 24.6% households receiving benefits according to HIES Report 2010. In rural areas, 34.5% households received benefits from SSNP in 2016, compared to 30.1% rural households receiving benefits in 2010. In urban areas 10.6% of households received SSNP benefits in 2016 compared to 9.4% in 2010. The higher proportion of rural households received safety net benefits than urban households in both the HIES survey years.

6.2.4 Public Food Distribution

Public food distribution has historically played an important role in improving food security of the poor. After the food price crisis of 2007-08, the government augmented public food distribution by maintaining adequate public stock. Public food distribution increased from 1.30 million metric tons in 2007-08 to 2.13 million tons in 2008-09. Public food distribution was successively increased over the subsequent years. In the fiscal year 2010-11, public distribution was augmented to 2.29 million tons of which distribution through Open Market Sale (OMS) and Fair Price Card (FPC) alone was 1.20 million tons. It was widely held that this volume of food distribution through OMS/FPC contributed substantially to stabilization of coarse rice price in the market. In the subsequent years, the government further increased food distribution through the public food distribution system (PFDS). Public distribution was raised to 2.22 million tons in 2013-14 and 2.77 million tons in 2019-20. The government faced problem in its food operations due to inadequate storage facilities. The government has therefore taken initiatives to expand and improve foodgrain storage facilities by building additional good quality modern storage facilities[10].

6.3 Utilization of Food

Utilization is the third pillar of food security. Improving availability of and access to food will not ensure food security unless food is utilized properly. Utilization of food is governed by a number of factors such as peoples' health status, food preference and the overall environment under which food is processed and consumed.

6.3.1 Determinates of Food Consumption

Income

Income is the prime determinant of food consumption. Table 24 shows the changes in monthly income of the households over a few successive years. As is expected, monthly household income increased from 2000 to 2016 by about 3 times both at national, rural and urban levels. Urban incomes were significantly higher than the rural household incomes. Although the nominal incomes of both rural households increased rapidly over the past years, distribution of income worsened during the period. Table 24 shows that Gini coefficient was 0.451 in the year 2000 which increased to 0.467 in 2005, then decreased marginally to 0.458 in 2010 and then increased significantly to 0.483 in 2016. This implies that although the monthly average nominal income of households increased quite rapidly over the past years, poor people did not get good share of the incremental income, rather their relative income deteriorated during the period under review.

Price

Price is another important factor determining food consumption. Figure 22 shows changes in monthly nominal wholesale prices of coarse rice and wheat flour (atta) from April 2014 to December 2019. It is evident that wheat price remained relatively stable at lower level compared to the coarse rice price which showed wide range of fluctuations during the period. The rice price was lowest during April 2016, then gradually increased up to August 2017, then decreased sharply up to December 2019. Figure 23 shows movement of real prices of rice and wheat flour for the period from April 2014 to December 2019. Rice prices had high fluctuations during the period. Wheat flour price was persistently lower than the

10 The government has undertaken a project for construction of 0.53 million metric tons capacity storage facilities through the Modern Food Storage Facilities project with financial support from the World Bank.

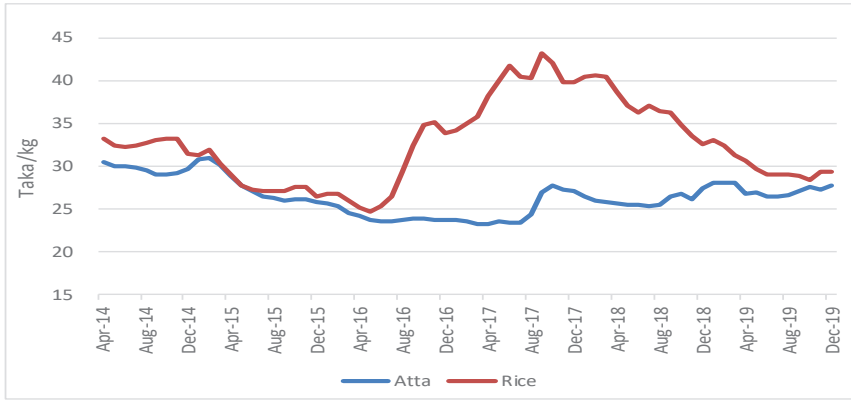
rice price. After the galloping rise of price of rice, resulting from abnormal rise of nominal price, the prices had drastic fall upto 2019. After April 2017, both rice and wheat flour prices had a negative trend with moderate fluctuations. The declining trend of real prices of rice and wheat was conducive to the interest of the poor consumers.

Table 24: Changes in monthly household income by rural and urban location of households

Survey Years	Monthly household income			Gini Coefficient
	National	Rural	Urban	
2016	15,945	13,353	22,545	0.483
2010	11,479	9,648	16,475	0.458
2005	7,203	6,096	10,463	0.467
2000	5,842	4,816	9878	0.451

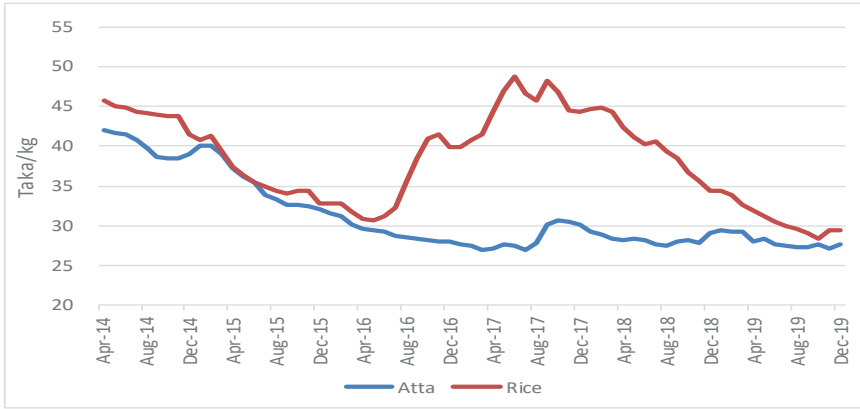
Source: HIES Reports, 2000, 2010, 2016

Figure 22: Monthly national average retail price of rice and wheat flour



Source: BBS: Yearbook of Agricultural Statistics, Various issues.

Figure 23: Retail real prices for rice and wheat flower (att



Source: FPMU Databse, Ministry of Food

6.3.2 Determinants of Food Utilization

Dietary Diversity and Health Status

Dietary diversity is essential for improving the nutrient adequacy of diets for better health and nutrition. People of Bangladesh consume cereal as the main diet, although its intake has fallen from 464 gram per day in 1995-96 to 367 grams in 2016. The HIES Reports show that the national consumption of cereals has decreased to 64% of daily energy intake per capita in 2016 from 70% in 2010 (HIES 2010 and 2016) which is close to the target of 60% to be reached by the year 2020 (FPMU, 2019a).

The Second Country Investment Plan (CIP2) seeks to improve diets by promoting consumption of nutritious, safe and diverse food for healthy life. It also includes the integration of Water, Sanitation and Hygiene (WASH) practice to prevent food borne diseases that can affect food utilization and nutrient absorption by human body. Dietary diversity is highly influenced by production diversity for ensuring increased availability of nutritious foods e.g. fruits, vegetables, fish, meat and milk.

Storage, processing and cooking practices

Available and accessed foods are not quite often properly utilized due to loss of quality and nutritional values due to improper storage, processing and cooking practices. Loss of quality of grains under government storage is very common. This happens due to ageing of stocks and improper conditioning of grains. Storage loss at farmers' level is also substantial which needs to be assessed properly.

Deterioration of quality during transportation and processing is also an important factor. In the case of rice, major quality losses occur during parboiling, drying and husking. Utilization of food is also largely affected by cooking practices. Cutting of vegetables into tiny pieces, excessive washing and boiling often cause serious deterioration of quality and nutritional value. All these aspects need to be taken into consideration because even under condition of adequate availability and accessibility, food security may not be achieved due to poor utilization of food.

Food Preference

Food items generally have two types of characteristics: objective and subjective. Nutritional content of food is generally considered as objective characteristics. Subjective characteristics include a wide range of factors such shape, size, taste, colour and aroma. If for the same volume of food containing same amount of nutrient, some people pay more than others due to other characteristics, they may be paying more for the subjective as opposed to objective characteristics of food.

Peoples' preference for subjective characteristics of food may have implications for food security and nutrition because food and income transfer programmes are generally designed to improve nutritional status of poor people. If people, out of their preference for subjective characteristics, pay more for the same quantity with same nutrient content of food, they may be paying more for the same nutrient content of food, whereas with the extra money they could buy more food and hence nutrients. From consumers' point of view, it may lead to lesser food security and reduced nutritional welfare (Talukder, 2013). Behaviour change communication with dissemination of improved nutritional knowledge may play an important role in improving such situation.

7. Food Consumption and Nutritional Outcomes

7.1 Consumption of Food

Actual consumption of food is the real indicator of availability of and access to food for the people. Table 25 shows per capita daily intake of all foods for different survey years. It is interesting to note that per capita food consumption did not continuously increase over the years. There were some fluctuations in the total food intake of rural, urban and all people over the survey years. In particular, per capita food consumption in 2016 was less than that in 2010 for rural, urban and all households.

Table 25: Per capita daily food intake (grams) in different survey years

Year	Per capita food intake (gram)		
	National	Rural	Urban
2016	976	974	979
2010	1000	1001	986
2005	948	946	952
2000	893	899	871
1995-96	914	911	931
1991-92	886	878	938

Source: HIES Surveys

Table 26 shows per capita per day intake of major food items and the corresponding desirable requirements. It appears that per capita rice consumption persistently decreased over the survey years and consumption of 367 grams of rice in 2016 was close to the desirable requirement of 350 grams.

Although Bangladesh produces enough potato and per capita daily requirement of potato is 100 grams, habitual intake of potato did not exceed 70 grams over the past survey years. Per capita intake of vegetables reached the maximum of 167 grams in 2016 against the requirement of 300 grams per day. Fish consumption was recorded at 62.6 grams per capita per day which was slightly higher than per capita requirement of 60 grams. For all other food items such as fruits, pulses, milk/milk products, meat and egg, per capita consumption fall far short of requirement (Table 26).

Figure 24 shows changes in per capita intake of total food and rice for 1991-92 to 2016 period as available from various rounds of the HIES. As expected, per capita intake of rice decreased monotonically during the period from 478 grams/cap/day in 1991-92 to 367 grams in 2016, indicating that people diversified food consumption over the past years. This is evident from higher consumption of vegetables, fruits, meat, fish and edible oil over the years under review (Table 26). It is interesting to note that decline in rice consumption was more pronounced during the 2010-2016 period.

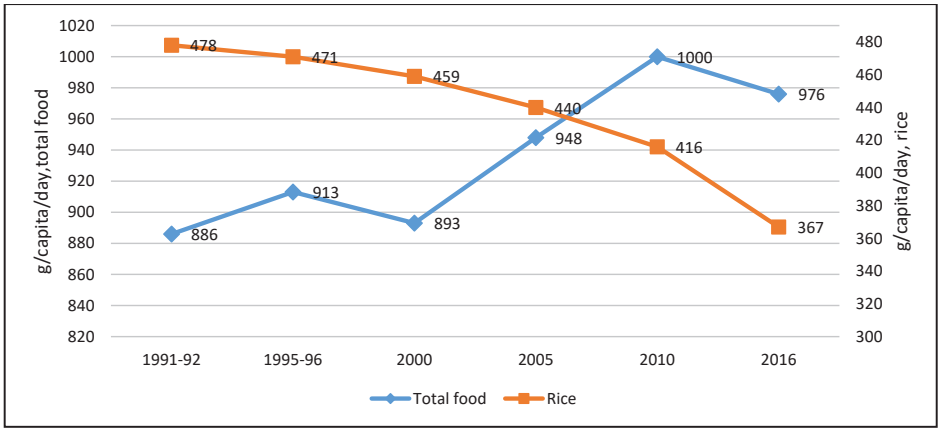
Table 26: Per capita (gram/ day) food intake by major food items

Food items	2000	2005	2010	2016	Desirable intake
Rice	458.5	439.6	416.0	367.2	350
Wheat	17.2	12.1	26.0	19.8	
Potato	55.0	63.3	70.3	64.8	100
Vegetables	140.5	157.0	166.1	167.3	300

Food items	2000	2005	2010	2016	Desirable intake
Fruits	28.4	32.5	44.7	35.8	100
Pulses	15.6	14.2	14.3	15.6	50
Milk/milk prod.	29.7	32.4	33.7	27.3	130
Meat, poultry, egg	18.5	20.8	26.2	30.9	70
Edible oil	12.8	16.5	20.5	26.8	30
Fish	38.5	42.1	49.5	62.6	60
Sugar/ gur	6.9	8.1	8.4	6.9	20
Total food	893.1	947.7	1000.0	976	1280

Source: HIES 2010, 2016 Desirable intake is obtained from Desirable Dietary Pattern for Bangladesh. NFPCSP/FAO study by Nahar 2013.
Note: Since food items mentioned in the table are not exhaustive, total food mentioned in the last row of the table does not correspond to total of all foods mentioned in the table.

Figure 24: Changes in total food and rice intake in Bangladesh, 1991-2016



Source: HIES 2005, 2010, 2016 data

Figure 24 also shows changes in total food consumption during the 1991-92 to 2016 period. It is interesting to note that while total food consumption moderately increased during the 2000-2010 period, it moderately decreased during the 2010-2016 period. However, Table 26 also shows that the desirable level of total food consumption is 1280 grams/cap/day. The change in total food consumption behaviour indicate that the relatively rapid fall in rice consumption may have contributed to the fall in total food consumption. In other words, it may be assumed that the fall in rice consumption may not have been adequately compensated by consumption of other food items. Thus, consumption diversification needs to be scaled up to increase total food consumption up to the desirable level with increased motivation of people to consume non-rice foods containing higher nutritional values.

7.2 Consumption Pattern of Nutrients

The levels of per capita calorie and protein intake compared to the desirable level of intake is presented in Table 27. It is interesting to note that per capita calorie intake decreased from 2266 kcals in 1991-92 to 2210 kcals in 2016, with some minor fluctuations during the period. The highest calorie consumption was 2318 kcals in 2010, but even that level of consumption was lower than the desirable level of consumption of 2430 kcals per/cap/day. The lower consumption of calorie may partly be attributed to the fact that people shifted

some consumption away from the calorie-dense food rice to other foods. However, as has been mentioned, consumption of other foods was also not sufficient enough to compensate for lesser intake of rice.

Table 27 also shows the levels of protein intake for the HIES survey years compared to the desirable level of requirement. It is evident that for most of the survey years, per capita protein intake was 63 grams/day which was moderately higher than the desirable intake of 58 grams. The apparent per capita protein sufficiency in presence of calorie deficiency may be a threat to protein adequacy because of the dynamic calorie-protein relationship. It is generally held that in presence of calorie deficiency in the diet, the available protein may be converted into calorie, so that a person with gross protein sufficiency may be rendered protein deficient in net term.

7.3 Dietary Imbalance: Implications for Nutrition and Health Status

Dietary diversity is important for human health status. Dietary imbalance and inadequate intake of micronutrients are the major causes of poor nutritional outcomes. High consumption of cereals and low intake of fish, vegetables and edible oils result in low levels of absorption of micro-nutrients and high level of anemia and nutritional deficiency. About 76% of the total dietary calorie comes from cereal. Contribution of other foods to total calorie are roots and tubers (3.8%), pulses (2.5%), meat, fish, egg and milk (4.0%), fruits and vegetables (2.2%) (FPMU, 2017).

Table 27: Per capita calorie and protein intake for Bangladeshi households

Survey years	Calorie intake (Kcal/capita/day)		Protein intake (gram/capita/day)	
	Actual	Desirable	Actual	Desirable
2016	2210	2430	64	58
2010	2318		66	
2005	2239		63	
2000	2240		63	
1995-96	2244		65	
1991-92	2266		63	

Source: 1. HIES 2005, 2010, 2016
2. Desirable intake figures are from Nahar (2013)

Adequate intake of four micro-nutrients namely Vitamin A, folic acid, iron and calcium play a vital role in growth, physical and cognitive development. Inadequate intake of food from animal sources leads to reduced availability of good quality protein, vitamin A and iron. Inclusion of a wide variety of green leafy vegetables in the diet may increase the intake of folic acid.

Chronic energy deficiency and overweight of women need attention:

The proportion of women remaining underweight or under chronic energy deficiency was 22% in 2011 which declined to 17% in 2013 and further declined to 16% in 2015. On the other hand, the proportion of overweight increased from 30% in 2011 to 39% in 2013 and further increased to 41% in 2015. While maternal underweight is a matter of concern,

the rapidly increasing threat to health is obesity, which has more than doubled compared to that in 2004 (FPMU, 2017). Iron and folic acid supplementation is recommended as a public health intervention to improve hemoglobin concentration and reduce the risk of anemia. The coverage and compliance of iron-folic acid supplementation is low due to poor awareness and inadequate access to the iron-folic acid tablets. Nutrition is also affected by food safely, hygiene and sanitation factors. Food and water safety and unsafe storage and preparation of food are also the key challenges that need to be addressed. Factors such as enteric and respiratory infections also need due attention.

Childhood mortality and child health

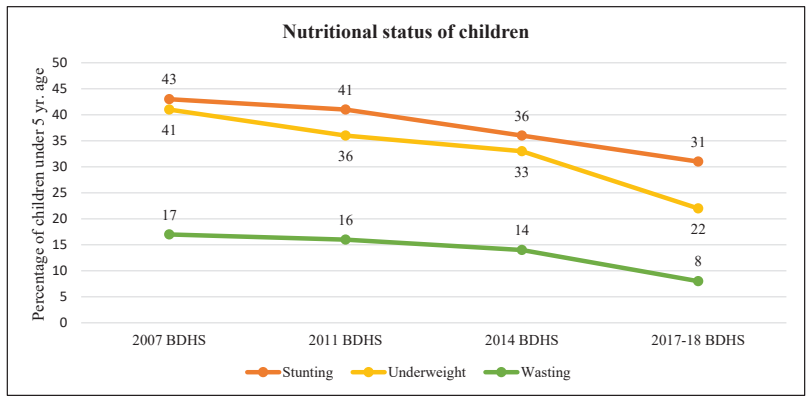
Infant and child mortality rates are the basic indicators of a country's socioeconomic condition and quality of life. One important objective of the Bangladesh Demographic and Health Survey (BDHS) is to measure the levels of and trend in the mortality of children. According to BDHS 2017-18, under-5 mortality between 2014 and 2018 was 45 deaths per 1000 live births. The infant mortality rate was 38 deaths per 1000 live births, and the child mortality rate was 7 deaths per 1000 children. During infancy, the risk of dying in the first month of life (30 days) is nearly 4 times greater than in the subsequent 11 months. Dehydration from diarrhea is an important contributing factor of child mortality. The administration of oral rehydration therapy is a sample way to counter the effects of dehydration (BDHS, 2019).

Child nutritional status

The nutritional status of children in the 2017-18 BDHS can be compared with what has been set forth by the World Health Organization (WHO) child growth standards. The WHO identify breastfed children as the normative model for child growth and development. The standard can be used to assess the nutritional status of children all over the world regardless of ethnicity, social and economic environment and feeding practices.

Height for age reflects the cumulative effect of chronic malnutrition. A child who is more than 2 standard deviations below the median (-2SD) of the WHO reference population in terms height for age is considered short for his or her age, or stunted. The 2017-18 BDHS estimated that 31% children under age 5 were short for their age, or stunted. The prevalence of stunting was higher among children living in rural areas than those living in urban areas.

Figure 25: Trends in nutritional status of children, 2007-2017



Source: Bangladesh Demographic and Health Survey, 2017-18.

Weight for age is considered as an overall indicator of a population's nutritional health. Children whose weight for age is below 2 standard deviations (-2SD) from the median of the reference population are classified as underweight. The 2017-18 BDHS estimated that 22% of the under -5 children were underweight in the country. The prevalence of underweight was found highest in Sylhet (33%) and lowest in Dhaka and Khulna (19%).

Weight for height reflects relatively current nutritional status of under -5 children. A child who is more than 2 standard deviations below (-2SD) the reference median for weight for height is considered as too thin for his or her height, or wasted. The 2017-18 BDHS estimated that 8% of children under -5 were thin for their height and hence were identified as suffering from wasting. (BDHS 2019).

Figure 25 shows the levels of stunting, underweight and wasting in different years. According to BDHS results, stunting decreased from 43% in 2007 to 31% in 2017-18, the declines being moderate in each successive survey years. Underweight decreased moderately from 41% in 2007 to 33% in 2014, and rather sharply to 22% in 2017-18. The pattern of decline in wasting was similar to that in the case of underweight. After a moderate decline in wasting from 17% in 2007 to 14% in 2014, the rate declined sharply to 8% in 2017-18.

Bangladesh prepared agenda for achieving the SDG targets on child nutrition. The milestone set for achieving the target in 2020 were 25% for stunting and 12% for wasting. Thus, Bangladesh is considered to be on track of achieving the targets in line with SDGs (GED 2018a).

7.4 Gender status in agriculture, food security and nutrition

Women in Bangladesh constitute about 50% of farm labour force. But as they belong to mostly small holding farms, their access to productive assets and inputs including farm credit and agricultural extension services is limited. Although female agricultural labour has a significant contribution to productivity, gender bias exists in the labour market, remunerative employment of labour remains skewed in favour of men. Women in Bangladesh are disadvantaged relative to men with respect to productive assets such as land, livestock and agricultural machinery and human capital (Quisumbing et al. 2013). Gender discrimination stems from social restriction that forms the underlying structural cause of women's food insecurity and malnutrition. It limits their control over economic assets, creates barriers against generating income, excludes them from household decision making and eventually restricts their access to food. Women in Bangladesh are victims of inequality, oppression and exploitation, leading to their lack of employment opportunity which restricts them in the mainstream development activities (Marufa 2007).

Women are involved in all aspects of production, processing and distribution. They work as unpaid family workers, self-employed producers, on-and off-farm employers, entrepreneurs, traders and providers of services and caretakers of children and the elderly (Catherine 2011) Ahmed et al. (2017) provides evidence from ANGEL project results that both agricultural and dietary diversity is enhanced if women along with their male counterparts are provided with training on farm production, nutrition and gender sensitization.

Sraboni et al. (2014a) found that per capita expenditure has a strongly significant association with empowerment for men and women. The pattern for women reflects a kind of an inverse u-shaped relationship in women's empowerment. Women in the lowest quintals

may feel disempowered, not only because agriculture is considered a male domain, but also due to the fact that the household is too poor to have access to resources important for agriculture. The proportion of empowered women increased with higher expenditure quintile but dropped marginally at the top quintile, which may reflect the value placed on female seclusion and consequently less involvement of women in agriculture activities in richer households. The results for men would be a monotonic positive relationship between income and empowerment. Analyzing the regional comparison of gender parity, Sraboni et al. (2014a) also found that at the national level 39% of women had gender parity with primary male in their household. Among the Divisions, Barisal had the highest degree of gender party, with 46% of the women being as equally empowered as the primary male in their households. Gender inequality was highest in Chittagong and Sylhet, with only 30% of the households having gender equality.

In another analysis, Sraboni et al. (2014b) found that women's group membership was positively and significantly correlated with calorie availability and dietary diversity. This implies that increasing the number of groups in which women actively participate has the positive impact on household food security outcomes. The study also found that women's ownership of assets and rights over assets had significantly positive coefficient in the regression analysis, implying that female ownership and control over major household assets had a role to play in improving household food security. Regarding the relationship of human capital and household food security, the analysis showed that education of the household head had a positive and significant relationship with calorie availability and dietary diversity. The positive relationship between farming as the main occupation with calorie availability and dietary diversity, as was found in the analysis, is consistent with other results that diversity in agricultural production increases dietary diversity at household level.

The Bangladesh National Women Development Policy 2011 makes comprehensive provisions for women's rights and empowerment through land ownership, health, education, training, credit facilities and income generation with a view to improving food security and nutrition. Also, there are government programs which directly or indirectly have impact on food security and nutrition. The secondary school stipend, School Feeding Programme, Vulnerable Group Development Programmes are designed to have some impact on food security and nutrition. The other safety net programmes include Maternity Allowance for Poor Lactating Mothers, Employment Generation Programme for the Poor, Microcredit for Women Self-employment, Special Assistance for Women Entrepreneurship Development, Women's Skill based Training for Livelihood etc.

8. Emerging Issues on Food Security and Nutrition

8.1 Issues relating to agricultural growth

Bangladesh emerged as the fastest growing economy in Asia. Annual growth rate of GDP was registered at greater than 8% during the year 2018-19. The agricultural sector had a growth rate of 3.5% during 2017-18. This growth rate was one of the highest over the last 8 years. The growth rate of the sector of 2.79% in 2015-16 and 2.98% in 2016-17 was unsatisfactory. Slow growth of the crop sector was the contributor to the overall slow growth of the sector. The growth rate of the crop sector was 0.88% in 2015-16 and 0.96% in 2016-17. Overall, growth of agriculture had a lot of fluctuations over the last decade and the rate needs to be stabilized at around 4% to maintain the cherished GDP growth of greater than 8%.

The fisheries and livestock sectors together generated 39% agricultural value added in 2015-16, compared to 36% in 2007-08. This indicates that while the composition of agricultural GDP is changing towards diversification from crop-based to non-crop sectors, the process is slow. Increased demand for animal products and a structural transformation towards an organized and market-oriented aquaculture system have been the main contributing factors for food production diversification. The contribution of the crop and livestock sectors to GDP decreased in 2015-16, and the contribution of fisheries and livestock sectors increased by 0.9% and 0.05% respectively. The trend of sector wise agricultural GDP indicates that though the growth of production diversification process was slow, it was continuous (FPMU, 2017). The slow and fluctuating growth of agricultural GDP remains a matter of concern. The growth needs to be stabilized at a higher rate to make meaningful contribution to the overall GDP growth to drive Bangladesh to the level of middle-income country.

8.2 Issues relating to income distribution

The steady growth of per capita income and moderate decline in poverty over the past years has not been associated with any appreciable increase in income distribution situation in the country. The overall Gini coefficient slightly increased from 0.451 in 2000 to 0.467 in 2005, then marginally decreased to 0.458 in 2010 but moderately increased to 0.483 in 2016, indicating that income distribution worsened over the past years. Although the absolute magnitudes of Gini coefficients were lower in rural than in urban areas, rural areas also experienced worsening of income distribution as indicated by the rise of Gini coefficient from 0.390 in 2000 to 0.430 in 2010, and further to 0.454 in 2016. In urban areas, income equality slightly improved between 2000 and 2010, as reflected by the decline in the Gini coefficient from 0.50 to 0.45 during the period, but it again increased to 0.498 in 2016. The income distribution situation at the disaggregated level depicts even a worse picture. According to HIES 2010 results, income accruing to the bottom 5% households was only 0.78% compared to as high as 24.6% of income accruing to the top 5% of the households. The results of the HIES 2016 shows even a worse picture. According to this report, income accruing to the bottom 5% of the households was 0.23%, compared to 27.9% of income accruing to the top 5% of the households. On the consumption side HIES 2010 results showed that although per capita daily food intake increased over the past years, per capita consumption of the lowest expenditure group was 40% lower than that of the highest expenditure group. The report also showed that the overall consumption inequality was substantially lower than income inequality. The overall income inequality is a matter of concern and needs serious policy attention. However, the worsening of income distribution situation, particularly in rural areas is a matter of even greater concern and calls for pursuing a pro-poor growth strategy.

8.3 Issues relating to dietary diversity

Dietary diversity is important for improving the nutrient adequacy of diets for better health. Typically, Bangladeshi diet is cereal dominated in which rice remains the main cereal consumed, although its consumption has fallen from 464 grams/capita/ day in 1995-96 to 367 grams in 2016, which is closer to the desirable norm of intake. The HIES reports show that national consumption of cereals has decreased to 64% of daily energy intake per capita in 2016, which is a decline from 70% in 2010. The target consumption of cereal in the per capita energy intake is 60%. The consumption of nutrient-dense foods such as meat, egg, fruits and vegetables increased over the past years. Nutrient density helps in closing

the nutrient gap in the diet. While consumption of pulses, vegetables and fruit steadily increased from 1995-96 to 2016, fish consumption increased by almost a third from 43.8 grams 62.6 grams during the period. Fish consumption increased as a result of overall production of fish in the country. Egg consumption also increased from a low of only 3.2 grams per capita in 1995-96 to 13.6 grams in 2016. Beef consumption slightly increased from 6.6% grams per capita in 1995-96 to 7.5 grams in 2016. Consumption of fruits and vegetables, according to the HIES 2016, is 203 grams which is about half of the WHO/ FAO recommendation of 400 grams/cap/day.

Dietary diversity among women of reproductive age is very critical. The minimum dietary diversity for women is assessed by using dietary diversity score. Dietary diversity score of women is a proxy of micronutrient adequacy in their diet. About 46% women had minimum dietary score in 2015. This means they consumed foods from five food groups out of nine. From 2016, a new indicator called Minimum Dietary Diversity for Women (MDD-W) is in use. A target has been set for achieving 75% of MDD-W by the year 2030. Monitoring of progress suggest that Bangladesh is not on track to achieve the dietary diversity target. From 2011 to 2014, the proportion of women achieving minimum dietary diversity has remained unchanged at around 29%, and from 2014 to 2015 it increased to 31% (FPMU, 2019b).

Comparison of the actual consumption data with the data on Desirable Dietary Pattern indicates significant gap for major food items. The supply and consumption of nutrient dense foods need to be increased for bridging the nutrient gap. To this end, policies need to address and enhance nutrient density and diet quality for augmenting dietary diversity of people.

8.4 Issues relating to effect of climate change

Bangladesh is said to be the most vulnerable country to climate change impacts, although it has very little contribution to carbon emission. It is one of the top 10 nations that are mostly vulnerable to climate change by the end of the century (Mahmood, 2012). Bangladesh has already been suffering a lot in coping with the adverse effect of global warming. The Global Climate Risk Index has been analyzed to see the extent to which countries have been affected by the impacts of weather-related events. This index ranked Bangladesh at 6th position among the most at risk countries from extreme events due to climate change (GED 2018b).

The most important effect of climate change is the rise in temperature caused by greenhouse gas emission. Rise in the sea level due to global warming and melting of Himalayan glaciers will make the country severely vulnerable to flood because of its geographical location. Decreasing water navigability of the different rivers and canals due to sedimentation caused by insufficient and improper timing and mode of rainfall will extend the length of flooding duration. Frequent and extended length of flood will severely affect agricultural production and the livelihoods of the people.

It has been predicted that the rise of mean annual temperature will be 3.3 °C per century. Presently see level is rising at a rate of 3.3(± 0.4) mm/yr due to added water from melting ice sheets and glaciers and the expansion of seawater. This phenomenon will directly affect Bangladesh because of its low elevation and connection with the Bay of Bengal. According to a study conducted by ADB, Bangladesh is projected to face 2% loss of annual

GDP by 2050 and more than 9% loss of GDP by 2100 under BAU scenario (Ahmed and Suphachalasai, 2014) (as cited in GED, 2018b).

As timing and intensity of rainfall is changing, it will adversely affect the livelihood of the people especially the farming households. Productivity of most of the crops is sensitive to different climatic parameters like temperature, rainfall and sunshine. The average temperature of Bangladesh increased significantly during the past years. The average temperature of the month of November increased by 2.5o C over the past 100 years (Hasan and Rahman, 2013). With increases in warming of about 2°C above pre-industrial levels, crop yields will decrease regardless of potentially positive effects (World Bank, 2013). With the changing temperature there would be increased monsoon rainfall, but decreased dry season rainfall. The situation will cause serious disruption in agriculture by creating shortage of water during the dry and excessive water in the wet season.

Increased natural calamities like tidal surge, cyclone and inland monsoon floods will create serious problem in maintaining roads, railways, river embankments, and drainage infrastructure which will require US$ 3.3 billion by 2050 according to World Bank estimate (World Bank, 2011). By this time about half of the 123 coastal polders will be overtopped and shrinkage in mangrove forests will increase the velocity of storm surges.

Intrusion of saline water caused by rise in sea level will directly affect the livelihood of the people living in coastal region. Climate change is expected to increase the risk of salinity through two mechanisms. First, the deltaic regions and wetlands are exposed to the risks of sea-level rise and increased inundation causing salinity intrusion into irrigation systems and groundwater resources. Second, higher temperatures would lead to excessive deposits of salt on the surface, further increasing the percentage of brackish groundwater (Wassmann et al., 2009).

Increased flood risk to rice and other summer crops in Kharif (pre-monsoon & monsoon) seasons are likely to interact with other climate change impacts on the Boro (post-monsoon) rice crop production, leading to substantial economic damages (Yu et al., 2010). To meet the excess maintenance and repairing cost as well as construction of infrastructure to protect livelihood will require maintaining a resilience fund. Also, it will require significant amount of money for habitation of the people affected by the impacts of climate change.

Besides infrastructure development and protective measure there should be a need for Social Safety Net (SSN) programs to support the poor and severely affected people. Although Bangladesh has reasonably advanced in terms of setting up systems of SSN, but the programs taken by the government are not always adequate or as responsive to disasters as might be expected. The general SSN services are primarily responsive to poverty while additional effort is required to address climate change issue. Additionally, all poor are not benefitted with SSN services while a segment of non-poor are also benefitted from that. Some institutional constraints are existent in getting ministries to coordinate the SSNs in the context of climate change (Awal, 2014).

8.5 Issues relating to urbanization

After independence in 1971, Bangladesh had the lowest level of urbanization in South Asia. Since then urbanization has increased at a rapid rate. Between 1980 and 2011, the country's annual rate of growth of urban population was 4.2% which was higher than that

of India, Pakistan, Sri Lanka and Afghanistan. In 1974, only 9% of the total population was living in urban areas. In 2011, this figure reached 23%. The total number of urban population increased from 6.3 million to 35 million during this period (Osmani et al., 2016). Currently about 33% people live in urban areas. The salient feature of urbanization in Bangladesh is that it grew in an unplanned manner and consequently a large number of growing urban population turned to be slum dwellers.

Urbanization is also associated with lifestyle change of people involving lesser degree of heavy works and changes in food habits. Thus, while the battle against under nutrition continued to prevail, the opposite problem of over nutrition and the resultant problem of obesity has started to emerge in Bangladesh. The economic prosperity, changes in food habits and the overall problem in lifestyles are contributing to this process. The increasing integration of domestic markets with global markets, and through aggressive advertisement of non-native foods with doubtful nutritional qualities are being popularized, particularly among the children. But the nutritional quality of many of these processed foods remain questionable. The process is leading to endurance of double burden of malnutrition with coexistence of undernourishment and overweight/obesity, particularly among the urban people.

8.6 Issues relating to food safety, food adulteration and quality of processed food

In the Bangladesh food industry unhygienic practices in food handling is a common phenomenon. Countless restaurants, fast food outlets are cooking, baking and processing foods in extremely unhealthy environments. Unhygienic food is a significant reason of diarrheal diseases as well as malnutrition. Not only diarrhea but also different diseases caused by consuming adulterated or unhygienic food is continuously increasing health hazard of people.

Contamination of food with chemicals in most cases starts with residual effect of inputs used for crop production. Farmers intentionally or unintentionally use overdose of insecticide, pesticide and fertilizers due to lack of knowledge and awareness. This practice is very harmful for fresh fruits and vegetables. For livestock and fisheries products, chemical residues from other industrial wastes is alarming as they affect feed, fodder, water, medicine and many others. Besides these, sometimes producers use preservatives, artificial ripeners, growth hormones, colors to make their produce attractive. Use of DDT is prohibited in 49 countries and restricted in 23 countries around the world (Chowdhury et al, 2010).

Food chain contamination by heavy metals can be said as the most alarming concern for food safety because of their potential accumulation in biosystems through contaminated water, soil and irrigation water. The major sources of heavy metal contamination in soil are industrial discharge, fertilizers, contaminated irrigation water, fossil fuels, sewage sludge and municipality wastes, etc. (Islam et al., 2013). Heavy metals are subsequently up taken by crops from soil. Different types of chemicals, raw materials/ingredients, packing material, animals and birds, insects, rodents, garbage and sewage, soil, air/dust, water, virus and bacteria and industrial effluents are the major sources of food contamination in Bangladesh.

Besides contamination, adulteration of foodstuffs has emerged as serious concerns for safety of health in Bangladesh. There is a tendency among the businessmen and processors to adulterate food with ill motive of gaining more profit. Most of the foodstuffs, be it

manufactured or processed, are unsafe for consumption due to adulteration in varying degrees. They adulterate foods to increase its weight and/or make the food items attractive. This problem persists at every level from production, processing, preparation to consumption. Food manufacturers, processors, restaurants, fast food outlets are all involved in one way or another in this corrupt practice of adulteration. Foods are adulterated by using various harmful chemicals, toxic artificial colours and rotten perishables. These unsafe foods are contributing to the public health hazards seriously with numerous chronic and non-chronic diseases.

The multiplicity of enactments creates confusion in the minds of manufacturers, processors, retailers or even to the enforcement authorities to realize which law deals with which particular food safety issue. There is lack of effective coordination among several bodies in the food safety regulatory regime. The government has enacted the Food Safety Act 2013 and a Food Safety Authority has been formed along with formulation of some regulations. There is lack of resources and technical capabilities of the testing authorities to monitor food safety attributes. With the pace of technological development, the testing facilities or labs do not sometimes update their work and as a result, contaminants remain undetected which hinders proper and timely actions and monitoring of food safety attributes.

9. Strategies for Increasing Food Security and Nutrition

9.1 Developing more diversified and nutrition sensitive agriculture for the upcoming 8th Five Year Plan

In line with the Perspective Plan and Vision 2041, the vision of the 8th Five Year Plan is to enhance agricultural production and ensure food and nutrition security for all. The target would be to achieve self-reliance in food and enable people to meet their nutritional requirement. Increasing production and promoting export of high value crops can also be an option. Within the vision and targets, the strategies to be followed in the crop and non-crop agriculture would be as follows:

Crop Agriculture:

- Achieve the required increases in rice production and promote diversification of agricultural crops through dissemination of information on technologies in the relevant agro-ecological zones.
- Devote research and development activities for productivity increases of hybrid and HYV of rice and other crops through technological progress on stress tolerant varieties and devote efforts to reduce yield gap for the existing varieties, better seeds and efficient management.
- Increase storage capacities and build additional storage facilities to facilitate safe storage of rice and other perishable crops both in the public and private sectors. Also encourage formation of production and marketing cooperatives to facilitate sale of farmers' products at remunerative prices.

Crop diversification:

For improving human nutrition and soil health, the 7th Five Year Plan emphasized crop diversification in a big way. The National Agriculture Policy 2018 also has put strong emphasis on crop diversification. Considering the importance of crop diversification, the

government implemented two successive Crop Diversification projects during 1990s. But rice is still the dominant crop and less reallocation of land has occurred during the period. For strengthening crop diversification, several steps will be taken in the 8th FYP which will include (i) reinforcing research activities on reduction of yield gaps by encouraging soil-water-crop management for crop diversification and (ii) strengthening research relating to diverse cropping pattern by maintaining soil fertility and producing high value crops to increase farmers' income.

Non-crop agriculture

There has been substantial growth in livestock production, the major expansion taking place in poultry production. The most critical areas for livestock development include dairy development, meat and poultry production, breed development, feed and animal management, veterinary services and animal health care, marketing of livestock products and institutional development for research and extension.

Fish production has rapidly increased in the country through (i) pond culture, (ii) production and supply of hatchery-reared fingerlings and (iii) gher culture of brackish water shrimp. Due to the high-income elasticity of demand for fisheries products, the demand for fish products will increase during the 8th FYP.

The strategies during the 2021-2025 period would include the following:

- Putting high priority to aquaculture by increasing intensity of cultivation by devising appropriate technologies.
- Using cage culture in rivers and flood plains.
- Putting emphasis on facilitating supply of inputs and promotion of technological knowledge to educated youths in aquaculture production.
- Encouraging community fishing by freeing the water bodies from the big lease takers of jalmahals. This will require policy reforms including change in the power structure.

Nutrition sensitive agriculture

Nutrition sensitive agriculture and food-based approaches are sustainable strategies for eradicating hunger and malnutrition including micronutrient deficiencies. FAO advocates for explicit incorporation of nutrition objectives into agriculture, health, education and social protection policies in developing countries. Nutrition-sensitive food and agriculture-based strategies including food production, dietary diversification and food fortification would ensure sustainable food and nutrition security, improve diets, combat micronutrient deficiency, and raise levels of nutrition (FAO 2014).

Food based strategies promote production of micronutrient–rich foods such as vegetables, fruits, fish and meat, either for own consumption or for sale. Vegetables are the most affordable and sustainable dietary sources of vitamins and trace elements. Vegetable production and consumption is the most direct, low-cost method for most of the rural and urban poor to increase micronutrients in their diets. Leafy vegetables and tomatoes are

the important sources of vitamins, particularly vitamin A. Bangladesh adopted advanced technologies for bio-fortified agriculture. The country's first bio-fortified rice variety called BRRI Dhan 62 (enriched with zinc) has been released. This rice is capable of fighting diarrhea and pneumonia-induced childhood death and stunting. Presently almost 60% of the marketed edible oils are fortified with vitamin A (FPMU, 2014).

9.2 Enhancing purchasing power of people and improving employment and income

Increasing purchasing power and enhancing employment and income involves three broad strategies namely transitory shock management, employment generating income growth and targeted food assistance programmes. The measures to accomplish the objectives would include special measures for disaster mitigation in agriculture, increased supply of food through market and public distribution and investment in employment generation activities.

An important indicator of purchasing power of poor people is the rice wage which is the amount of rice a wage earner can purchase by his daily money wage. At the national level, rice wage increased in 2015-16 by 12.9% from 11.3% in 2014-15 on a three-year moving average basis. This was due to moderately smaller increase in the general wage index, compared to the increase in the national wholesale rice price index. Regarding nominal agricultural wage, the annual average wage increased continuously from 2002 to 2016. Nominal agricultural labour wage increased more than three times over the last decade, from Tk. 79 per day of work in 2004-05 to Tk. 312 in 2015-16. Agricultural rice wage also had a sharp increasing trend with many fluctuations. During the period from 2005 to 2016, the agricultural rice wage had the highest peak in May-June 2016, registering 12.9 kg of rice per day work, due mainly to rise in nominal wage. Thus, from the agricultural wage earners' point of view, the higher nominal and real wage would have encouraged them to stay in agriculture, rather than migrating to urban centres (FPMU, 2017).

An important way of increasing purchasing power of people is to expand rural non-farm employment opportunities. Bangladesh economy has undergone remarkable structural changes over the past decades. The HIES and labour force survey data have shown that while the growth of agricultural employment was 8%, that of rural non-farm employment was 25.5%, during the 2006-2010 period. Also, while the share of agricultural income decreased from 49.9% in 2000 to 47.8% in 2010, that of rural non-farm income increased from 50.1% to 52.2% during the period (FPMU, 2017). Expansion of rural transport infrastructure, electricity and telecommunication facilities are the prerequisites for rapid expansion of non-farm activities in rural areas. In designing policies for rural non-farm employment, female workers need to be given priority in the participation of non-farm activities. To achieve this desired objective, opportunities for women will have to be created through both public and private initiatives.

9.3 Developing more inclusive and nutrition sensitive social protection

Under this initiative, the effectiveness, targeting and content of social safety net programmes are improved to provide better protection of different vulnerable groups. This is done through the following sub-programmes: (i) expand and strengthen safety net programmes across the life cycle based vulnerable groups, (ii) expand and strengthen programmes for people living in vulnerable and disadvantaged geographical areas and (iii) introduce nutrition sensitive social safety net programmes including food fortification. Social safety

net spending has two components: social protection and social empowerment. Social empowerment covers a large portion of the safety net programmes under the ADP, while a large proportion protection are the pensions of the retired persons which do not target the most vulnerable people. Inspite of substantial government spending which stood at 2.54% of GPD in 2018-19 and 14.55% of the total government budget, coverage and impact on poverty was not of high magnitude as a large proportion of poor households did not have any access to social security programmes (FPMU, 2019a).

Regarding highlights of some nutrition sensitive programmes, the Ministry of Primary and Mass Education in collaboration with WFP provide fortified biscuits with vitamins and minerals to pre-primary and primary school children in high poverty prone areas. The programme also includes learning package for children, and other neighboring people for vegetable gardening, health care, nutrition and hygiene. This initiative contributed to significantly higher enrolment rates and higher degree of primary education completions.

In order to make PFDS more nutrient sensitive, efforts need to be made to offer micronutrient-fortified foodgrains in the open market operations and through the safety net channels. The Government in collaboration with the WFP and private sector is introducing a fortified rice (called pushti chal) for reducing micronutrient deficiency.

One of the important safety net programme run by the government is the Vulnerable Group Development Programme (VGD). While the broad aim of the programme is to protect the poor women and their families against food insecurity and hunger, the more specific objective and design of the programme has been turned into development-oriented efforts in which training is provided on income generating activities. The programme was initially launched by the Ministry of Disaster Management and Relief, but now it is implemented by the Ministry of Women and Children Affairs.

One important element of the National Social Security System (NSSS) 2015 is the consolidation of a large number of fragmented programmes into a smaller number of inclusive core programmes based on life cycle. This involved a consolidation of all programmes into five categories of public expenditure financed social security programmes that would address poverty and risk at different stages of the life. In the consolidation process, a total of 145 programmes have so far been reduced to 118 programmes.

9.4 Adaptation strategy to counter the effect of climate change

Bangladesh has to suffer and fight a lot due to climate change despite its little contribution to global warming. To cope with the effects of climate change, the country has been adopting strategies keeping in view the pattern of climate change. Bangladesh has wide experience in managing disaster and the country is known to have shown resilience to climate change impacts. Public initiative to tackle the climate change impact is also a pioneering one. Bangladesh is the first country to set up its own Climate Change Trust Fund (BCCTF) from its own resources. The Government has allocated nearly $ 400.million to the BCCTF as a national response to tackle the climate change risks (GED, 2018b).

Agriculture provides livelihoods to most people in the coastal region; therefore, conservational techniques should be introduced for sustainable agriculture. Climate smart adaptive technology could be the better option to counter the effect of climate change. Research and infrastructural development is necessary to cope with the changing situation.

Development of salinity, drought, extreme temperature tolerant variety would be very crucial to counter the effect of climate change.

Furthermore, low resource consuming farming techniques needs to be introduced. It would make sense, for instance, to rely on rice varieties that can be grown in rain fed condition through utilization of rainwater. The same can be said for other crops. Some other options like floating agriculture, different water and nutrient conservational approaches can be promoted for better management of natural resources. Policies should be taken to promote adverse condition tolerant crop varieties, machineries and management practices.

To prevent intrusion of saline water in the southern part of Bangladesh, steps need to be taken to retain monsoon waters to increase the river water flow in the dry season. This process would be difficult but with the help of proper technology and long-term planning it will not be impossible.

Coastal embankments and other protective infrastructures have to be managed better as a safeguard against the frequent occurrence of natural calamities. These structures are to be developed in a manner that could be able to give protection to the people and resources against the sea level rises. There should be provisions to repair damaged embankments fast.

Measures will have to be taken to increase navigability of the rivers to carry away frequent flood water. As timing and intensity of rainfall is changing due to climate change, water holding and carrying capacity need to be increased. It is very important to have proper planning for construction and maintenance of canals, dams, embankments for regulating water flows.

Resilience fund need to be created and properly maintained to support affected people during the time of distress. Proper initiatives need to be taken to acquire and properly utilize funds from Green Climate Fund (GCF) for mitigating long term effect. Proper use of national and international funds in developing infrastructure could be very helpful to increase capacity to counter the adverse situations. Appropriate action plan and measures for habitation through proper utilization of funds would increase strength to counter the adverse effects.

It is important to build disaster-resilient rural infrastructure, taking into account the needs of women and vulnerable groups. Proper planning and preparation of rehabilitation is essential to support the possible climate refugees. As rural to urban migration increases, appropriate urban planning and adequate urban infrastructure need to be ensured. Moreover, livelihood opportunities must be created rural and new urban centres, so that people will be attracted to other places than in the crowded existing cities. Initiatives should be taken to increase the standard of living and employment opportunities in rural areas to counter check the trend of migration.

As Bangladesh hardly contributes to the phenomenon of climate change, there should be strong global negotiations so that funding and technical expertise are provided to such countries that are vulnerable to climate change. Global cooperation is needed to achieve the required reduction of greenhouse-gas emissions. It also needs to be kept in mind that there are limits to the extent that climate change adaptation can be achieved and also it is a matter of proper long- term planning.

9.5 Ensuring food safety through food chain

A properly nourished agriculture can play an essential role in improving food security and nutrition in a country like Bangladesh. In some cases, particularly in adulteration, there is clearly an economic motive behind. But this may be due to other factors such as lack of awareness. The most important initiative at the production side would be awareness building among the farming households so that production practices can improve the quantity, diversity, and nutritional quality of the produce for home consumption as well as for sale. It's high time to undertake policies for flourishing diversified, nutrition-sensitive agriculture by maintaining safer food production attributes. The policies would not be focused on just the rate of growth, but also the pattern and quality of growth.

Well-developed agricultural value chains through institutional innovations like contract farming can reduce the risk of contamination or adulteration through agreement on quality standards within the chain. Contract farming can be institutionalized with necessary stipulation of provisions in the contracts to protect the interests of the contracting parties including the smallholder farmers. Appropriate policy support needs to be provided by the public authority in this effort. Agribusiness firms often also agree to support farmers through a variety of services, such as input supply, extension advice, and transportation of produce to their premises. Forward and backward integration could increase accountability of the value chain actors and investigation of quality attributes of the food will be easier than investigating a wide range of producers, processors, suppliers and marketing agents. So, popularizing and nourishment of such initiatives would be helpful for food safety.

There is no alternative to awareness building among the farming households regarding Good Agricultural Practices (GAPs). It is essential to increase surveillance on different actors of the market as well as to aware consumers about the food safety attributes. Responsible authorities and personnel should monitor processors and business peoples to prohibit the use of banned and low-quality ingredients during processing and storage of food products.

Establishment of laws and introduction of proper monitoring system requires coordination among the authorities responsible for ensuring food safety. An integrated view and related operational procedures are necessary for ensuring food safety so that a framework combining laws and regulations including standards, food safety management, inspection and enforcement services along with communication and training could be helpful.

Implementation of regulations also requires several tools such as quick and quality food testing facilities along with efficient manpower. Mobile laboratories could be helpful with adequate supply of technicians and testing kits to run those laboratories. The BSTI laboratories alone may not be enough. There should also be central food testing facilities at least in every divisional city.

Another matter of high importance is the budgetary resources available to the institutions. It appears that institutions particularly those which have various mandates including food safety usually do not have specific budgetary provisions earmarked for operationalization of their food safety related activities (Asaduzzaman et al., undated.).

Parliament of Bangladesh passed the Food Safety Act 2013 under which the Bangladesh Food Safety Authority (BFSA) was constituted to strengthen collaboration among inter-

ministerial and inter-agencies bodies for ensuring food safety and food control. The government also constituted 64 District Pure Food Courts and 6 Metropolitan Pure Food Courts in 2015. Considering risk based inspection and determining safety standards, the BFSA has drafted the following regulations: (1) Food Safety (Sample Collection, Test and Analysis) Regulation 2015, (2) Food Safety (Contaminants, Toxins, and Harmful Residues) Regulation 2015, (3) Food Safety (Food Additives) Regulation 2015, (4) Hygiene Preservation and Preparation of Food Regulation 2016, (5) Labeling of Packet Food Regulation 2016, Bangladesh Food Safety Authority Service Regulations 2016 and (7) Bangladesh Food Safety Authority Service Rules 2016 (FPMU 2017). The implementation of the Bangladesh Food Safety Act will be accelerated after finalization of these regulations and rules.

10 Resource Allocation

The need for resource allocation during the 8th Five Year Plan has been assessed in this exercise based on historical allocation for agriculture in the development and non-development sectors compared to the national budget allocations. Table 28 presents a short historical pattern of total national budget and allocation for the agriculture both in development and non-development sectors since 2014-15. During the period, both total and agriculture budget in absolute term has increased. Compared to the agriculture budget, total budget increased at a higher rate, except for the year 2018-19. While compared to 2014-15, total budget in 2019-20 more than doubled, budget for agriculture increased by 1.7 times and the rate of increase was uneven across years, particularly for agriculture revenue budget which even decreased in the year 2017-18. During the period, agriculture development budget increased by around 2.6 times, whereas agriculture revenue budget increased by around 1.5 times. The relatively higher growth rate for development budget and its increasing share in total agriculture budget indicates that government is increasingly attaching importance to agricultural development in the country. However, the rate of increase in the allocation for agriculture compared to the total budget increase has always been lower. The percentage increase in the allocation for agriculture in 2017-18 was precariously lower. Consequently, the allocation for agriculture in the total budget in that year was the lowest at 4.78%.

Table 28: Trend in agricultural budget allocation

FY	Total budget (crore tk.)	% increase in total budget	Agriculture budget				Allocation of agriculture in total budget (%)
			Revenue (crore tk.)	Development (crore tk.)	Total budget (crore tk.)	% increase in total budget	
2019-20	523,190	18.22	17,003	11,347	28,350	11.82	5.42
2018-19	442,541	10.56	15,484	9,870	25,354	25.76	5.73
2017-18	400,266	17.52	12,593	7,567	20,160	3.22	4.78
2016-17	340,605	15.42	12,848	6,683	19,531	7.27	5.73
2015-16	295,100	17.80	12,254	5,954	18,208	14.35	6.17
2014-15	250,506		11,551	4,372	15,923		6.36

Note: Agriculture budget includes total allocation made to the broader agriculture sector including allocations to Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Environment and Forest, Ministry of Land, and Ministry of Water Resources.
Source: Budget in Brief, Ministry of Finance, Government of Bangladesh

Table 29 presents proposed budget allocation for agriculture in the 8th FYP. The historical allocation as presented in the previous table showed that there were moderate fluctuations in the annual percentage increase in the national budget and major fluctuations in the percentage increase in the budget for agriculture over the period under review from 2015-16 to 2019-20. In proposing allocations in the national budget as well as allocations for agriculture, we rationalized a fixed proportion of annual increase in both the budgets. Accordingly, we proposed fixed annual increase of 17% for national budget and 14% for the budget for agriculture for the period from 2020-21 to 2024-25, for which the base year was 2019-20. Since 2015-16, the average annual increase in the total budget and agriculture budget was around 16% and 12% respectively. We assumed an additional 1% and 2% increase respectively for the total and agriculture budget during the next plan period.

Table 29: Proposed budgetary allocation for the agriculture sector during the 8th FYP

FY	Total budget assuming constant 17% increase in successive years (crore tk.)	Total budget for agriculture assuming constant 14% increase in successzive years (crore tk.)	Allocation of agriculture in total budget (%)
2020-21	612,132	32,319	5.28
2021-22	716,195	36,844	5.14
2022-23	837,948	42,002	5.01
2023-24	980,399	47,882	4.88
2024-25	1,147,067	54,586	4.76

Source: Own calculations based on data from previous budget allocations

Table 29 shows the proposed allocations for the national budget and the budget for agriculture during the 8th FYP. The table shows that the national budget increased from Tk. 612,132 crore in 2020-21 to Tk. 1,147,067 crore in 2024-25. The corresponding budget for agriculture increased from Tk. 32,319 crore in 2020-21 to Tk. 54,586 crore in 2024-25 during 8th plan period. The allocation for agriculture in the national budget ranged from 4.76% to 5.28% during the plan period. As regards increase of allocation within agriculture in the budget, it is expected that the annual percentage increase in the development budget will be higher than that in the revenue budget during the plan period.

11 Concluding Remarks

Bangladesh is moving with the vision of achieving the status of high-income country by 2041. To achieve this milestone, the country has set several targets and planned development strategies. The country already achieved the lower middle income status by 2015, and aims to achieve the upper middle income status by 2021 and the high income status by 2041. In this journey, agricultural sector is critical for accelerating GDP growth, ensuring nutrition security and livelihood of those earning their livelihood from agriculture. In this context, increasing production is not enough, rather production portfolio needs to be diversified, particularly for ensuring nutrition security and increasing farm income. A transformation of the country's agriculture sector towards commercialization and sustainable production system is urgently needed.

The major success of the agriculture sector has been to attain self-sufficiency not only in rice, but also for potato, fish and meat production. Bangladesh is one of the top fish producing countries in the world. Projections of major food items shows that Bangladesh is likely to achieve marginal to moderate surplus status in the production of major food items. In recent times, growth rate of agriculture sector, particularly the crop sub-sector, has been stagnant, which is below the targets set in the 6th and 7th FYP. The sector faces several major challenges: (i) climate change associated impact and its implications; (ii) losing of agricultural land and shrinking average farm size; (iii) poor education-research-extension-farmer linkage, (iv) irrational use of chemical inputs; (v) low productivity and innovations in the sector; (vi) low level of farm mechanization and value chain development; and (vii) inadequate agro-processing development and commercialization.

Rice still dominates Bangladesh agriculture. In recent years, there has been some diversification which is largely due to increasing cropping intensity. Agricultural diversification will allow shifting from cereal based cropping patterns to cereal and non-cereal based high value products that includes not only crops but also fisheries and livestock products. The benefits will be multifold including nutrition security, higher farm profit, resistance against pests and insects, safeguard against risks and uncertainty, and overall, its contribution to sustainability of the agricultural system.

Further, diversification requires pragmatic and progressive policies of transformation to commercially sustainable agriculture where productivity gain through technology innovation and adoption will be the key factor. The research institutes under the NARS system and agricultural universities need to conduct research for developing AEZ focused non-rice crop varieties and improving cost-effective technologies. For field level adoption of these technologies, DAE needs to focus on ICT and community-based approaches. To make sure that the farmers can reap the benefits of diversification, their access to market and value chain needs to be ensured.

To attain the objectives of the 8th FYP, the suggested policies would be to: (i) Ensure productivity gains through technology innovation and link farmers with the market to promote agricultural productivity and diversification; (ii) Ensure sustainable agriculture and green growth through rational use of chemical inputs and technology adoption; (iii) Promote farm mechanization and reduce post-harvest loss; (iv) Innovate and adopt rice yield gap minimization technology; (v) Develop storage facilities at the community level and ensure farmers access; and (vi) Establish strong education-research-extension-farmer linkages by encouraging use of ICT, ensuring institutional access of the farmers and promoting human capital development.

In the context of food security and nutrition, although Bangladesh has made substantial progress in reducing stunting and underweight, some more progress needs to be done to comply with the international standard. An important issue relating to food security and nutrition is the agricultural growth. To maintain GDP growth rate at more than 8%, agriculture needs to grow at the rate of more than 4%. Income distribution is another issue which needs attention. There has been major deterioration in the distribution of income as has been indicated by the Gini coefficients. Although there has been some improvement

in dietary diversity, it needs to be improved further. To face the overarching effect of climate change, further adaptation mechanism needs to be developed. Rapid urbanization has given rise to increase in slum dwellers which in turn has deteriorated the health and sanitation. To prevent migration to urban areas, urban facilities need to be made available in rural areas. Nutrition sensitive agriculture needs to be promoted through expansion of vegetable production and biofortification of agricultural products. Food safety has become a major food and nutritional security issue. Food safety needs to be improved in the food chain through prevention of heavy metal contamination, and by pursuing good agricultural practices (GAP) through the food chain. The Food Safety Act 2013 needs to be implemented through enforcement of the relevant rules and regulations.

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Study 9:
Efficient Land Management for Industrialization and Urbanization -Consistent with the concept of "My Village My Town".

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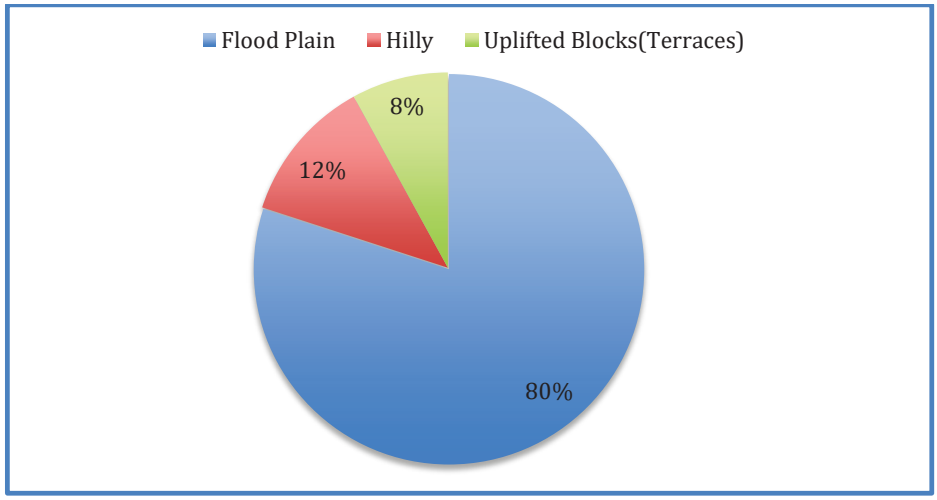
1. Introduction

Bangladesh has been very successful in different fronts of its development agenda, with GDP growth accelerating to higher than 7% per annum in recent years, and crossing 8% in 2018-19, resulting in very robust reduction in poverty levels. Poverty rate fell by more than half to 24.3% during the period 2000-2016. The period also saw faster urbanization, with industry overtaking agriculture as share of GDP. The manufacturing and services sectors have been growing fast, share of industry and services in 2018-19 rising to 31% and 56% of GDP respectively, compared to 13% for agriculture. This is creating challenges to efficient use of land.

The total area of Bangladesh is about 1,47,570 sq. km with population over 160 million, which makes Bangladesh a densely populated country and land-man ratio is lowest in the world, which is estimated to be 0.06 hectares (ha) per person. The cultivable land in 1983-84 was 20 million hectares and in 1997 it dropped to 17 million hectares (MOL, 2014). If it continues, per capita arable land will be reduced to below 6 decimal in 2050. As shown in Figure 1 below, 80% of Bangladesh is flood plain, 12% is hilly and the remaining 8% is what is termed as uplifted blocks (terraces). Land administration related reforms needs to find ways to optimally make use of the very finite landmass to take forward the development agenda as spelt out through the Perspective Plan 2041 and the BDP 2100.

Figure 1: Land Forms in Bangladesh



Source: Bangladesh Bureau of Statistics

Land has competing use and key asset: Land is a finite resource, with requirements for human needs ever expanding from diverse social and economic activities. Land and housing are the most important assets of the poor. The land situation in Bangladesh is marked by three major characteristics: (i) very high population density and an adverse land-man ratio, (ii) land reforms at different times (See Table in Annex 1 for a list of the reforms) (iii) Quite a high percentage of total population are marginal and small farmers and landless laborers, as well as urban landless. It is well articulated that Bangladesh will be facing two enormous challenges in the coming decades: food security and climate change [1].

1 USAID Country Profile, Bangladesh, Property Rights and Resource Governance

Ensuring land rights and improving tenure security of both men and women have a greater impact on household income, food security and equity. In a challenging property rights environment, land can become a critical development challenge. Eliminating poverty and boosting shared prosperity; increasing food security; facilitating urbanization; addressing climate change; increasing resilience and reducing fragility; and reducing inequality and exclusion of vulnerable groups all depend on secure land and property rights [2].

While land is at the heart of agriculture/food security and the rural economy in Bangladesh; there is also fast growing demand for land from fast growing urbanization and rural settlement needs, as well as its growing demand for industry and infrastructure uses. The per capita agriculture land holding has been fast declining, and from the present level of 0.05 ha per capita agricultural land it is projected to decrease to 0.025 ha by 2050. There is urgent need to bring a healthy balance in land use, so that there is enough of prime agricultural land protected to ensure future food security, while also catering to the growing demand from housing, infrastructure, industry, and other non-agriculture needs. Secure tenure with complete land records and geospatial data are prerequisites for managing a balanced land use system, which will be necessary to support Bangladesh's strategic vision of attaining UMIC status by 2041.

2. Government Strategies on land Management in NSDS 2010, 6th and 7th FY Plans and BDP 2100, and What Has Been Achieved

The Government through its different plans have been highlighting different land related challenges that Bangladesh faces, and have laid out strategies to overcome those challenges, as documented in the NSDS 2010-2020 [3], Perspective Plan 2010-2021, the 6th YFP, the 7th FYP, and the BDP2100.

The NSDS-2020 had highlighted the land use challenges and also opportunities emanating from it. It points out that land use in Bangladesh is diverse and often conflicting: it is intensively used for agriculture, settlements, forests, shrimp ghers, natural fisheries, salt production, industrial and infrastructural developments and tourism, resulting in expansion in some existing land uses (urban area, settlement, shrimp etc.); increasing demands for new uses (tourism, export processing zones and others); and encroachment and conversion of land from one use to the other. This has resulted in steady decline of cultivable cropland by almost one percent per year, with agricultural land likely to decline from recent level of 0.05 ha per capita to 0.025 ha per capita by 2050. Besides the land use related challenge there is also the big challenges is in declining soil fertility for variety of reasons, including, for example, top-soil erosion, salinization, irresponsible use of irrigation water and fertilizers, which would impact agriculture productivity,

The NSDS-2020 has specified strategies overcome the challenge. It calls for optimizing land use, and the need for increasing land area of the country along the rivers and coast, and for declining soil fertility taking specific mitigation measures. These specific two-fold strategies have been put forth in both the NSDS-2020 and the more recent BDP 2100, and which needs to be fully acted upon during the 8th Plan period. These NSDS-2020 strategies which has also been reflected in the BDP2100 include accelerating land zoning process including formulation of necessary laws and acts; making sustainable land reclamation a priority action under the proposed Delta Plan 2100; and continue mangrove plantation in the newly accreted lands to stabilize lands.

2 World Bank Blog
3 National Sustainable Development Strategy 2010-2020

The Perspective Plan (2010-2021)[4] also recognizes that with 70% people leaving in rural areas, availability of agricultural land is getting limited and is reducing at 1 per cent per annum, with need for promoting sustainable land-use planning and innovative land management practices, with the objective of providing for the land requirements for rural and urban development through integrated and environmentally sound physical planning and land use.

The Government through the 6th Five Year Plan had articulated that its main goal of land use policy and management is to ensure best possible use of land resources and delivery of land related services to the people through modernized and efficient land administration for sustainable development with accelerated poverty reduction. The 6th FYP also resonates the NSDS 2020 and the Perspective Plan 2010-2020 on the issue of declining land availability for agriculture along with declining availability of water and soil fertility. As a strategy it is suggested to increase in crop yield.

The 6th FYP highlighted the distortions in urban land market, particularly due to lack of proper land development and management policies resulting in unplanned development of land in urban periphery. There is also inadequate supply of serviced land that results in speculation in the land market, and that over four decades leading to the 6th FYP period, the urban land price saw as much as 80 folds increase, having very negative impact on availability of affordable urban housing. The 6th FYP had called for sound land policies as a strategy to overcome the above discussed constraints. It called for taking measures to promote sustainable land use planning and innovative land management practices, and meet the land requirement for urban development through integrated and environmentally sound physical planning and land use. The 6th FYP particularly emphasized improvement in the land registration system, ensure efficient land transfers, facilitate public control of land markets that would lead to improved land use and land management. Land acquisition act and policy were also highlighted calling for rationalized system of fair and equitable compensation for acquired land.

The Government also was encouraged taking up of projects for the development of rural townships where specific areas would be earmarked for housing, marketplaces, industries and infrastructure. The 6th FYP suggested use of regulatory tools like zoning, and proposed that economic incentives and disincentives like tax exemption, transfer and development taxes be used to encourage land development in accordance with desired objectives. Such incentives and disincentives would particularly be important to help implement the desired expressed goal of "my village my town" concept.

The 7th Five Year Plan also has highlighted the necessity of managing the land constraint, which had been identified as a binding constraint, which any future growth strategy will have to take into account to ensure sustainability. This is particularly significant since the 7th Five Year had overarching goals of achieving sustainable development and accelerated poverty reduction, which particularly would require undertaking different land related actions as these would be influenced by state of land management and having in place appropriate land resource use policies and strategies. The constraint becomes critical because of the existence of a very inefficient land market that leads to speculative pricing driving land prices in urban, peri-urban, and rural areas to levels, which are not conducive for sustained growth.

4 PERSPECTIVE PLAN OF BANGLADESH 2010-2021 - MAKING VISION 2021 A REALITY

Some of the critical targets under the Seventh Five Year Plan for achieving the Vision 2021 and Perspective Plan targets, would require optimal land resource use for agriculture and food security and achieving the desired goal increasing share of manufacturing to 21% of GDP by FY 20 for accelerated creation of new quality jobs for the ever growing number youths entering the market. Besides, government has also been seeking a surge in FDI to $9.6 billion by FY20 and for that there are major investment plans for increasing infrastructural investment and civic facilities in peri-urban growth centers, especially under the new Special Economic Zones (SEZ) regime, as well as increased quality energy and physical infrastructure supply.

All of the above means that land availability for agriculture and food security would decline with increased demand for other uses, and so it requires better land management so that well balanced optimization of land resource use could be achieved that will support achieving the different targets and goals of the Seventh Five Year Plan, Perspective Plan and the future Five Year Plans. This would mean that for ensuring achieving the goals of these all the different strategies it will be imperative to have in place an efficient and transparent land management system.

During the upcoming 8th FYP, there will be need to undertake further actions to not only consolidate what has been achieved over the past decade, particularly in zoning and digitizing land administration, but to take to next level that can addresses not just what the Vision 2020, but also Perspective Plan 2041 and BDP 2100.

2.1 Progress made during 6th and 7th Plan period

There have been some positive changes to land related management during the 6th and 7th Plan periods. These include enactment of enabling laws and also increasing emphasis on computerization of the different processes. The Prime Minister's Office has enacted the Economic Zones Act 2010 for ensuring a more balanced use of land for industry making it more convenient for investors. The Ministry of Land has finalized the 'Agricultural Land Protection and Land Use Act, 2017'. [5] Ministry of Land (MoL) has also been implementing Coastal Land Zoning project and "National Land Zoning (2nd Phase)". By these projects, MoL has developed GIS based digital land zoning Maps of Upazilla based digital land zoning reports system.

There have also been several initiatives on land management that had been undertaken during the recent past to digitize various land related processes and activities, so as to bring in efficiency under strategies drawn out under the 6th and 7th FYPs. These are discussed below.

(i) E-Mutation. Some digitization has been introduced in the mutation process. This, termed as e-mutation, has made available on-line application system along with a more transparent process with the steps clearly defined and a time-line for receiving the service and the cost for each of the steps. The e-mutation process can get activated through the AC (Land) office either on receipt of Land Transfer (LT) notice from Sub-Registrar's Office or through direct on-line application by any applicant. This is recorded in a register and then sent to Union Land Office for verification and on-spot inspection. On completion of this task it is sent to Upa-Zilla Land Office, from where the AC (Land) sends out hearing-notice to the applicant and other relevant people. At the hearing by the AC (Land) the mutation

5 Website of Ministry of Land

request can either be accepted or rejected. Once accepted the Union Land Assistant Officer is required to prepare 05 copies of the *Khatian*, giving 01 copy to the applicant and sending 04 others to different government offices as per requirement. If rejected, then it can appealed through the ADC (Revenue) office. As per the MoL declared guideline the mutation process should be taking a maximum of 45 working days in non-metropolitan areas and up to 60 working days in metropolitan areas. The total charges at different stages for completing a mutation process is Taka 1170.

As it is obvious that while some improvements have been made, yet most the processes remain manual. It is particularly important to note that interaction between two important offices for generating the basic documents that can ensure property rights is still done manually. So the LT notice from Sub-Registrar's office (under Ministry of Law and Justice) to AC (Land) Office (under MoL) is still a manual process.

(ii) Integrated digital land recording system (IDLRS). During the 7th FYP, the Government launched a land governance reform programme funded by the European Union (EU) [6] for the following: (1) elaborating a land policy, (2) establishing an authoritative land record process inclusive of integrated digital land recording system (IDLRS). The programme had been executed under the Department of Land Records and Survey (DLRS) office of the Ministry of Land and piloted in four Upazilas: Amtali in Barguna district, Jamalpur Sadar in Jamalpur, Mohanpur in Rajsahi District, and for testing an initiative to improve the land administration system at field level, in the Manirampur Upazila in the Jessore district.

It has been judged a successful pilot project [7] but it is not yet operational. Digitization of land records can maintain the history of land ownership chains in Bangladesh, protecting valuable information from decay. In this manner all records should be scanned and archived, the older records for their historical value and the newer records for their use in today's mutation process. This needs to be continued but in a more coordinated manner as will be discussed later.

(iii) Digital Land Management (DLM) related projects. Digitization of certain aspects of land management with the intention of bringing transparency and providing better service delivery had been undertaken, and as part of it the Digital Land Management project (DLMP) got implemented between 2011 and 2016. The government had contracted a local IT firm in 2012-13 to create a digital archive of 1,15,000 mouza map sheets that were based on CS (Cadastral Survey), SA (State Acquisition), and RS (Revised Survey), and according to official document, 18,500 map-sheets have also been scanned and indexed. It has also been reported that around 65 lakh khatians (records of land rights) had been scanned and indexed into a computerized system under the government initiative. [8] The government implemented the project with intention to remove unnecessary complexities in land registration, transfer and other land-related issues.

The project also provided for necessary civil engineering costs for construction of a central data center in the Land Record and Survey Department, which had been completed, and necessary equipment has also been installed. Besides, a data backup and recovery center had been installed at the University Grants Commission (UGC) in the city's Agargaon area under the management of Bangladesh Computer Council (BCC). It is also reported that

6 EU Press Release 19/01/2017
7 Land Automation Planning Brief by TerraTech Limited – A collective local initiative for land automation
8 Dhaka Tribune Report October 07, 2017

under the project refurbishment work of 53 district and upazila offices has been completed, and that mentioned that 20 upazila Land Information and Service Centers have started to offer services and that consultants have been appointed to run them. However, the DLMP is yet be fully operational and requires to be moved forward in an integrated manner to be consistent with the digital Bangladesh strategy[9].

The solutions so far has been intermittent and piecemeal in nature: However, as will be discussed later, given the complexity of institutional structures relating to land management, by and large these intermittent project based approach by the different Ministries and agencies can only give piecemeal solutions. As such these projects have not seen full completion with full deployment of digitized services and digitized land related document in an efficient manner. What is required are more comprehensive sustainable solution with digitized links that easily can access different processes, which will bring transparency in administering property rights and improve ease of doing business.

3. Land Use Related Policies

In a land constrained country like Bangladesh, appropriate and comprehensive land related policies can be a means to achieving equity as well as economic and sustainable development goals. This could provide the appropriate platform for efficient land use planning, which refers to the way we plan the physical layout of communities, and is an essential component of a community's long-term resilience. It encompasses both the built and natural environment by shaping where development occurs and identifying areas for preservation.

Historically land related policies have been a continuation from what has been left behind during the British colonial rule; and Bangladesh has also been adopting policies with amendments with needs arising with changing times. MoL is the principal government Ministry involved in formulating policies, laws, rules and regulations relating to land governance, implemented by its different agencies. However, as will be discussed later there are some other Ministries which deal with their own sector specific policies, but which also impacts land governance. These will be discussed below, and the need for heightened coordination will be spelt out.

(1) Existing land related policies from MoL: Bangladesh has also adopted different land related policies but have bee largely constrained by implementation challenges because of complexity of the institutional structures, to be discussed later. Some of the policies are presented below.

(a) Among the different policies the **'National Land Use Policy (NLUP) 2001'**, is very important, and it asks for putting in place criteria based uses of land, providing 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 and providing guidance on the establishment of rail and highway and for tea and rubber gardens. It had set forth guidelines for improved land-use and zoning regulations. The NLUP was promulgated with the objective to help ensure criteria based uses of land and

9 Land Automation Planning Brief by TerraTech Limited – A collective local initiative for land automation - In this report it reports that the servers installed as part of the Digital Land Management System, which according them had been implemented with 20 service centers in 46 Upazilas, were not operational when they wrote the report. In that report it had also been suggested that for achieving a well-functioning DLMS with all its components would require appropriate capacity building among all levels of land administration in the public and private sectors.

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. [10] The policy, which had been issued by the Ministry of Land, recommended: (1) stopping the high conversion rate of agricultural land to non-agricultural purposes; (2) utilizing agro-ecological zones to determine maximum land-use efficiency; (3) adopting measures to discourage the conversion of agricultural land for urban or development purposes; and (4) improving the environmental sustainability of land-use practices.

The key targets to help achieve the objectives of the Policy were:

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

In a 2004 "Actionable Policy Brief", the government acknowledged difficulties in implementing the NLUP, which it attributed to the dispersion of land administration authority among many different ministries (GOB MOA 2006). Subsequently, a draft National Zoning Act and Village Improvement Act was prepared in 2010 in line with the Land Use Policy. However, these are yet adopted, officially, making difficult the full implementation of NLUP [11]. However, the preparation of a nation-wide Land Zoning Map is ongoing under a project implemented by the Ministry of Land, but its progress is very slow. Mapping of about 100 Upa-Zillas had been completed.

The existing policy (NULP) has been found falling short of providing guidance as to how cross-sectoral interests and plans relating to land should be coordinated [12]. To overcome the existing limitations of NLUP, a revision of the national Land Policy has been called for in the BDP 2100, by outlaying guiding principles on appropriate and sustainable use of specific type of land, sectoral and cross-sectoral land use and environmental management.

(b) Other important Polices of MoL: The MoL has also other important land management related policies, including 'Khas Land Settlement Policy, 1997'; 'Non-agricultural khas Land Settlement Policy, 1995'; 'Khas Land Settlement Policy for Hotel-Motel, 1998'; Land Acquisition related policies; 'Balu Mohal and Sand Management Rules, 2011';

10 BDP 2100
11 BDP2100
12 Gebremedhin, 2014

'Chringri Mohal Management Policy, 1998'; 'Jal Mohal Management Policy, 2009'; 'Salt Mohal Management Policy, 1992'. Two of these policies are discussed below.

(i) Khas Land Management Policies: A critical concern on a more efficient land resource management is the management of khas lands. There are two khas land management policies: (i) Agricultural Khas Land Management Policy, and (ii) Non-agricultural Khas Land management Policy. [13] 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 [14]. Non-agricultural khas land management policy was framed in order to address the issue of land-grab by powerful elites and lease procedure of those lands. Considering the serious consequences of grabbing non-agricultural khas land, the related policies are inadequate in terms of their coverage and plan of action.

The principal instruments governing khas land management have been the: 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.

There are, however, gaps particularly for non-agricultural khas land. The Policy does not provide clear guidelines on recovery procedure for grabbed land from powerful elites, other than the usual judicial process, as well as how to distribute non-agricultural khas land to urban poor or landless. Similar gaps will be arising for newly accreting land or reclaimed land in future. This will be critical governance issue, especially given that as revealed in BDP 2100 there will be more newly accreted and reclaimed along the cost and rivers.

(ii) Land Acquisition Related Policies: Land acquisition is a very sensitive and delicate issue for both the government and the land owners, which become necessary for moving forward the growth and development agenda of the country. It also changes the land use pattern, increasing use of land for non-agriculture needs. The land acquisition process is implemented under the "Land Acquisition and Requisition of Immovable Property Ordinance, 1982", which presents significant challenges in its application, as it is based on compensation rationale only. The compensation amount is arbitrarily determined though the effort has been to move to market determined prices, in an otherwise imperfect land market. Besides, the resettlement policy of Bangladesh is not adequate. So, land acquisition and the concomitant smooth resettlement process are always a challenge. 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.

Therefore, a comprehensive and modern technique of resettlement needs to be adopted in order to smoothen acquisition of land for public interest. In order to lead to a more rational

13 BDP 2100
14 Gebremedhin, 2014

way of handling it may be good to link it through a Spatial planning (e.g. like that of South Africa) [15] and also Zoning policy and law.

(2) Other Ministry led policies impacting land management: There other Ministries dealing in specific sectors and have also promulgate policies that impact land use and comprehensive land use planning. Some of those cross-sectoral land related policies that Bangladesh has include- the National Agricultural Policy, National Fisheries Policy 1998, Shrimp Strategy 2004, National Rural Development Policy, National Forest Policies 1994, National Industrial Policy 2010, Special Economic Zones Act 2010, and Coastal Zone Policy need to be aligned and harmonized in order to prepare a comprehensive land policy.

(i) Among those, ***the National Agriculture Policy 1999*** was an effort to ensure optimum use of land, and it recommended the following steps to be taken as a means to ensure planned utilization of land:

- Land zoning programme was suggested to taken up by the government on a priority basis.
- To ensure maximum utilization of land, bottom up planning through people's participation and its implementation had been proposed from the mouza or village level.
- Appropriate measures were to be taken in the light of the Land Policy of the government to stop the trend of fertile agricultural land going out of cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfield, etc.
- Acquisition of land in excess of requirement for non-agricultural purposes was to be discouraged.

(ii) The National Fisheries Policy 1998 also called for preserving lakes, beefs, ditches-canals and other open water bodes, and those to be renovated for fish culture without reducing in sizes. So had called for effectively zoning fishing areas. Similarly, the draft Shrimp Strategy 2004 stated that the need for appropriate regulatory framework by way of zoning for shrimp production. Areas suitable for shrimp cultivation were to be identified using a land zoning process, which would also limit brackish water shrimp aquaculture to coastal areas. The objective of land zoning is to optimize land use for these purposes involving all stakeholder groups participation.

(iii) The National Forest Policy, 1994 had affirmed that attempts would be made to bring about 20% of the country's land under the afforestation programs of the government and private sector by year 2015 by accelerating the pace of the program through the coordinated efforts of the government and NGOs and active participation of the people in order to achieve self reliance in forest products and maintenance of ecological balance. Inaccessible areas such as slopes of the hills, fragile watersheds, swamps etc. will be identified and kept as protected forests.

(iv) ***Policies on special economic zones through the SEZ Act 2010 and the National Industrial Policy 2010***: Bangladesh is strategically poised to increasing the size of industry and manufacturing as a percentage of GDP. This means that there will be increased demand for industrial land. This is already happening as industry is fast occupying space particularly

15 South Africa – Act No. 16 of 2013: Spatial Planning and Land Use Management Act, 2013

in Dhaka and the surrounding Districts as well as Chittagong causing environmental damages to surroundings including cropland, water bodies, rivers, and streams. This also puts pressure on urban, infrastructure and utility supply, thus creating competing demand on its limited land resource particularly in the context of agriculture/food security. So it is even more important that Bangladesh develop a land use plan that caters to all of the above needs, and SEZs could be one important input for a broader land use plan. In 2010, the Government rightly felt the need to further broaden the horizon of zones to optimize its benefits, particularly taking lessons from China and other successful East Asian countries and passed the Bangladesh Special Economic Zones Act 2010. The SEZ Act 2010 draws vastly on successful examples from around the world, as well as Bangladesh's positive experience with the EPZ model. As stipulated under the Act, the Government has also set up a new institution, the Bangladesh Economic Zones Authority (BEZA) [16]. The expectation is that under the new SEZ paradigm, with a regulatory authority in place, there will be quick implementation of new Zones, that get well regulated so as not to cause the external environmental damages on land resources, and where quality private investments including Foreign Direct Investment (FDI) can create the additional jobs that the country requires. This will also be in line with National Industrial Policy 2010, which seeks the government to track major land, water and related industrial projects and their impact on environment and also create awareness among the public on environment protection, pollution, dumping of hazardous material on land and water, with positive impact toward land and water protection as well as greening of the environment.

(v) There has been the **Coastal land Zoning Policy 2005** [17], which highlighted the need for land zoning for the coastal area of Bangladesh. It proposes the need for definite guidelines and raises the possibility of doing coastal land zoning through an inter-ministerial task force. The policy also provides scope for formulating Zoning regulations in due course. This would allow reclamation of land from the river delta and the Bay of Bengal in future, with better land governance there, and is clearly good place to pilot out spatial planning along with implementation of zoning practices, and try out My Village My Town concept.

There has been substantive work already undertaken in identifying the Coastal Zones. [18] The coastal zone of Bangladesh has been officially defined as consisting of 19 districts[19] and the Exclusive Economic Zone (EEZ). It has total area of about 47,201 sq. km with population density 743 per sq. km. The land is intensively used for agriculture, settlements, forests, shrimp ghers, water bodies and fisheries, salt production, industrial and infra-structural developments and tourism. In 1988 FAO created map on 31 Ago-Ecological Zones (AEZ) for whole of Bangladesh, and the coastal zone encompasses 10 of the AEZs with 41 sub-zones (BARC has digitized and geo-referenced this map).

16 There seems to a proliferation of Zones Authorities, which raises institutional challenges. Besides BEPZA and BEZA, the Government has also set up the Hi-Tech Park Authority (HTPA) to develop IT related Zones. Beyond these there is the BSCIC, which has for long building and running Industrial Estates. There is also a separate Private EPZ Act governing the Korean EPZ, administered by a Private EPZ Cell located in PMO.

17 A Dissertation by Mohammad Moniruzzaman Bakaul, MAGD Batch V, ID No-13372015 - Compulsory Efficient Use of Land (CEUL) for Land Zoning can contrive the rapid change of land use pattern: A Case Study of Charchartala Union,Ashuganj, Brahmanbaria

18 Coastal Land Uses and Indicative Land Zones – Integrated Coastal Zone Management Plan - Abdul Halim Mia & M. Rafiqul Islam - Working Paper- WP040

19 The districts are Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's Bazar, Feni, Gopalganj, Jessore, Jhalokati, Khulna, Lakshmipur, Narail, Noakhali, Patuakhali, Pirojpur, Satkhira and Shariatpur. Together these districts account for 32 percent of the area and 28 percent of the population of Bangladesh.

4. Land Governance and Related Laws and Land Use Related Regulations

Historic, legal, and regulatory experience related to land governance in Bangladesh. In every society, sound land governance and its administration are important for sustainable development. Land governance refers to institutional and legal systems, policies, laws, procedures, processes and the specific institutions by which land, property and other natural resources are managed. This includes decisions on access to land, land rights, land use, land tenure, land value, and land development in some way or another.

The land governance system in the South Asia sub-continent is very old. It evolved over hundreds of years leading to elaborate methods for agricultural tax assessment on rational basis during the Mughal rule. Bangladesh's land related laws, regulation, and practices also emanates from that which had been setup under Mughal and British colonial rule. [20] During the British colonial rule, they implemented a land management system based on large-scale cadastral surveys, which were conducted to demarcate the boundaries and extent of each individual landholding. Soil fertility was also classified to formulate and rationalize the levy and collection of land revenue from landholders of each and every village.

Legal framework governing land management. Some of the key land-related legislation that governs the land management of Bangladesh includes: Transfer of Property Act of 1882; Registration Act 1908; Bengal Tenancy Act 1885; Non Agricultural Tenancy Act of 1947; Bengal Rent Act 1859; State Acquisition and Tenancy Act of 1950; Acquisition of Waste Land Act of 1950; Bangladesh Land Holding Limitation Order of 1972; Land Reforms Ordinance of 1984; Land Reform Board Act of 1989; Bengal Alluvion and Diluvion Regulation 1825; Bengal Alluvial Lands Act 1920; Non Agricultural Tenancy Act of 1947; Acquisition of Waste Land Act of 1950; Bangladesh Land Holding Limitation Order of 1972; Land Reforms Ordinance of 1984; Land Reform Board Act of 1989, Act of XV of 1994 (The State Acquisition and Tenancy (Amendment) Act 1994);

Vested Property (Amendment) Law 2011; The Acquisition and Requisition of Immovable Properties Ordinance; 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

There are other land related laws like the Forest Act of 1927 as amended in 1989 has its roots in Indian Forest Act, 1878. The Forest Act grants the government several basic powers, largely for conservation and protection of government forests, and limited powers for private forests. The 1927 version of the act was amended in 1989 for extending authority over "any [Government-owned] land suitable for afforestation.

The State Acquisition and Tenancy Act of 1950 had established a 33-acre land ceiling on private landowners, and the Land Reforms Ordinance of 1984 placed a 21-acre ceiling on acquisition or holding of agricultural land and invalidated benami transactions, in which a person purchases land in the name of another so as to evade the land ceiling. Neither land ceiling law has been widely implemented [21].

Regulations and Laws relating to land erosion and accretion – Alluvion and Diluvion[22]

20 See Table at Annex 1 for a chronology of all the important land related actions, legislations and regulations, and other actions since 1950.

21 (USAID, 2010)

22 Banglapedia – Alluvion and Diluvion

: In the context of land accretion and land loss through Alluvion and Diluvion process, its rules of usage were given statutory shape for the first time by promulgation of the Bengal Alluvion and Diluvion Regulation 1825. The regulation of 1825 covered broadly two categories of land re-formation: in situ and new accretions. The right to land once diluviated and subsequently re-formed in the old site and the right to new accretion were identified as two distinct rights. The right of ownership of land re-formed in situ was considered to be incidental to one's title to a tangible property. This ownership principal of alluvion and Diluvion was further established through the tenancy law, as contained in sections 17 and 18 of the Bengal Rent Act 1859.

Administration of the Accreting land - the Char land: The Bengal Alluvial Lands Act 1920 was enacted to ward off conflicts that arose particularly through forcibly gaining possession of accreting char land by use of muscle power, particularly during the zamindari period. It was done with the objective 'to prevent disputes concerning the possession of certain lands in Bengal gained by alluvion or by dereliction of a river on the sea'. On 4 August 1972, President's Order No. 135 was promulgated to provide that in case of diluvion the rent of the holding shall be abated and the tenant's right of ownership shall be extinguished and the land on reappearance shall vest in the government, except the land in respect of which the tenant's right to repossession was finally recognized by the court or competent authority before in situ.

The position was again changed in 1994. By the amending Act of XV of 1994 (The State Acquisition and Tenancy (Amendment) Act 1994) provision was made for abatement of rent in the case of land lost by Diluvion and subsistence of the right to land re-formed in situ for 30 years, subject to the ceiling of 60 bighas. The present legal position is that all chars other than those re-formed in situ within 30 years of diluvion are the property of the state, which the government may settle in accordance with the rules.

Bangladesh, being a delta has a long problem of river erosion and also accretion along the banks and beyond. The accretion creates chars. This is a major land administration issue and for which there are different laws and regulations that are prevalent. Given that the three mighty rivers Ganges/Padma, Brahmaputra/Jamuna, and Meghna continues to carry silt and deposing as it enters the Bay of Bengal, there are new chars arising and the BDP 2100 has strategies for making available new land. This will require new regulations and governance structures to ensure sustainable development of those areas.

Laws and regulations governing economic zones: In 2010, the Government rightly felt the need to further broaden the horizon of zones to optimize its benefits, particularly taking lessons from China and other successful East Asian countries and passed the Bangladesh Special Economic Zones Act 2010. The SEZ Act 2010 draws vastly on successful examples from around the world, as well as Bangladesh's positive experience with the EPZ model. As stipulated under the Act, the Government has also set up a new institution, the Bangladesh Economic Zones Authority (BEZA) [23]. The expectation is that serviced land for industry will be optimally allocated in right locations under the new SEZ paradigm, with a regulatory authority in place, there will be quick implementation of new Zones so that local firms can harness spill-over impact from Foreign Direct Investment (FDI), and

23 There seems to a proliferation of Zones Authorities, which raises institutional challenges. Besides BEPZA and BEZA, the Government has also set up the Hi-Tech Park Authority (HTPA) to develop IT related Zones. Beyond these there is the BSCIC, which has for long building and running Industrial Estates. There is also a separate Private EPZ Act governing the Korean EPZ, administered by a Private EPZ Cell located in PMO.

in the process additional investment can be encouraged within value chains. The Act also has provisions for private and PPP based zones, and has provisions adaptation to required environmental and social practices through rules, streamlined regulations, and institutional setup. Prior to the SEZ Act 2010, there were Acts promulgated to set-up government Export Processing Zones (EPZs) and Private EPZs. The zones once established, gets governed by the Zones related Acts within their specified land areas. If properly implemented this could one of the key conduits for safeguarding land for agriculture use.

5. Land Use – Issues and Practices [24]

Land is an asset, which is scarce, and fragile, and in the case of Bangladesh it becomes even more precarious because Bangladesh is a land-constrained country with high population density and its vulnerability to the vagaries of climate change. It also needs ways create good jobs for an ever-increasing youth population in order to capitalize on this demographic dividend.

The changing pattern of land use from primarily rural agrarian to increasing urbanization and increasing role of manufacturing and services is because of not only changing demographics and increased success of Bangladesh in its social indicators but also because increased income opportunities outside agriculture, both in the domestic economy and also opportunities arising for overseas employment. As researched by Ashraful Alam et al [25] increasing accessibility to non-farm economic opportunities and growing number of nuclear family units imbues new dynamics in the rural spatial and non-spatial structures. Increased literacy rate, flow of remittances, access to electricity, electronic media and information technology have created a new mix of winners and losers who further distance themselves from farming practices. The land use pattern will require an understanding of the trends in rural and urban uses, which are presented below.

5.1 Agricultural and Non-Agricultural land availability trends

Agricultural land included cropland, forest, mangrove forest, river, lake, beel and haor, aquaculture, tea estate and saltpan. Total agricultural land has reduced by 1,126,750ha during the past 34 years (1976-2010) with yearly average loss 33,140ha. [26] The average yearly loss of agricultural land accelerated between periods, thus increasing from 0.18% during the period 1976-2000 to 0.44% during 2000-2010. In 2010, agriculture accounted for 82% of about 14,840,000 hectares of land with non-agriculture land being about 18%. Non-agricultural land included rural settlement, urban and industrial estate and accreted land. The non-agricultural land was estimated 1,183,605ha, 1,788,307ha and 2,400,867 ha, which correspond to 8.17%, 12.31% and 16.18% during 1976, 2000 and 2010 respectively. The trends are presented in Figure 2 below.

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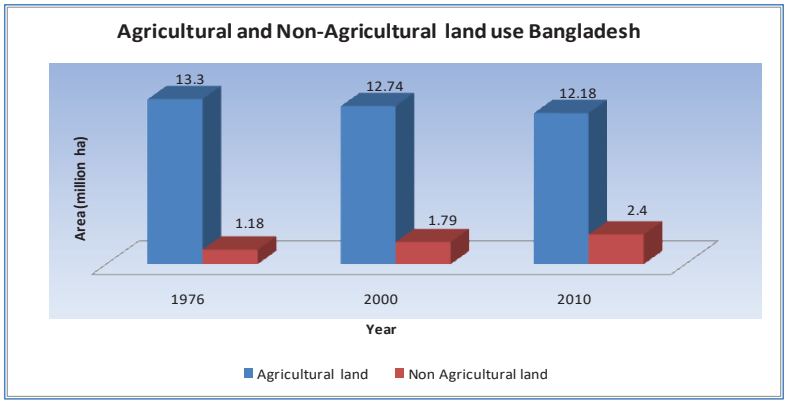
24 This Section heavily draws from the Soil Resource Development Institute (SRDI), Ministry of Agriculture, 2013 Report Agricultural Land Availability in Bangladesh by M. Nazmul Hasan, M. Shahadat Hossain, M. Abdul Bari, M. Rafiqul Islam; and the Bangladesh Delta Plan 2100 (BDP2100).

25 A.F.M. Ashraful Alam, Rumana Asad, Md. Enamul Kabir - Rural settlements dynamics and the prospects of densification strategy in rural Bangladesh.

26 Trend in the availability of agricultural land in Bangladesh: Soil Resource Development Institute (SRDI). The study was by a team was led by Md. Nazmul Hasan under National **Food Policy Capacity Strengthening Programme** of the Government of Bangladesh and supported by USAID, EU, and FAO.

Figure 2: Trends of Agricultural and Non-Agricultural Land Cover Between 1976 -2010



Source SRDI, 2013

The land utilization pattern as of 2010 is presented below in Table 1. The majority of the agriculture land was cropland, which had been about 59 %, with cropping intensity of 190% in single, double and triple cropped areas. The majority of the non-agriculture land had comprised of rural settlements and that had accounted for 11.9% of the land while urban and industrial land had accounted for accounts only 0.6%.

Table 1: Land Utilization/Land Cover of Bangladesh in 2010

Land cover type		Year2010
Gross area (ha)	**Area(ha)**	**% of total**
Agricultural land:	**12,176,904**	**82.1**
Crop land	87,51,937	59.0
Forest	14,34,136	9.7
Mangrove forest	4,41,455	3.0
River	9,39,073	6.3
Lake	51,739	0.3
Beel and Haor	2,50,727	1.7
Aquaculture	175,663	1.2
Tea estate	96,152	0.6
Salt pan	36,022	0.2
Non-agricultural land:	**2,400,867**	**16.2**
Rural settlement	17,66,123	11.9
Urban & Industrial	87,616	0.6
Accreted land	5,47,128	3.7
Others(unidentified)	**2,62,229**	**1.8**
Total	**14,840,000**	**100.0**

Source: SRDI, 2013

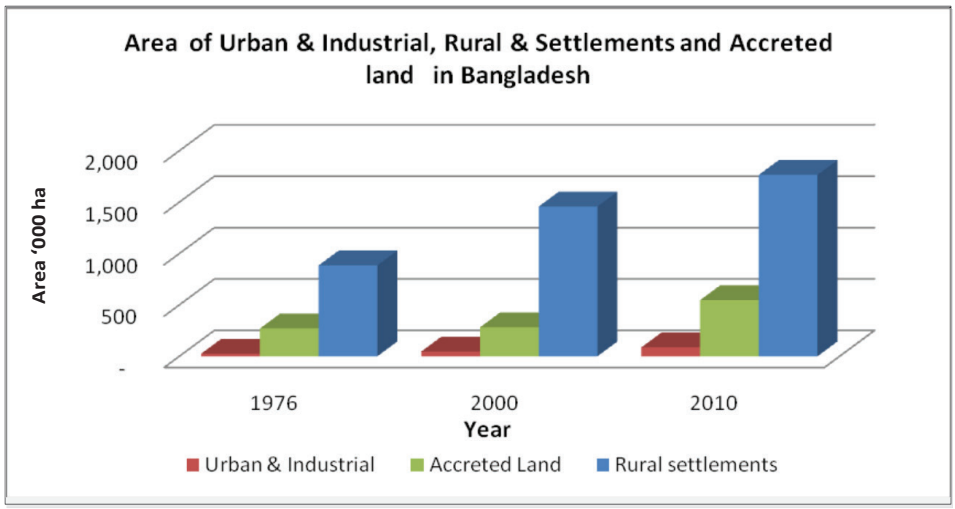
During that period Bangladesh has seen fast growth of manufacturing sector as well ever increasing size of cities, towns, and other urban and peri-urban centers across the country. This means that there has been further depletion in availability of agriculture land.

Agricultural efficiency gains helped overcome land-loss impact: While availability of cropland has been declining, farmers have been able to raise productivity, a very positive

factor, that has resulted in crop production growing three folds during the period and it continues to grow. Crop productivity increase has bee driven by technological evolution, and farmer's ability to adopt new technology, and increased accessibility to markets, particularly the urban markets facilitated by road infrastructure development. There has also been growing diversity in agriculture products with farmers responding to market signals and policy support; and has witnessed surge in aquaculture with cultivation increasing at an annual average rate of 2.24% between 2000 and 2010. This has substantially increased protein availability. A very comprehensive classification has been done as part of Land Resources Appraisal of Bangladesh for agricultural development; where Bangladesh has been subdivided into 30 agro-ecological regions and 88 sub regions. [27] The major components of these regions and sub-regions are physiography, soil properties, soil salinity, depth and duration of flooding which are relevant for land use and for the assessment of present and future agricultural potential. Each of these agro-ecological zones is characterized with differences in soils, climate and hydrology and is also areas with varying degrees of risk apropos disastrous floods, drought and cyclones. The agro-ecological zoning knowledge could be used in any future spatial planning and zoning initiative to optimize land use to suit the strategic development goals of the country.

Trend of Urbanization and Industrial land use [28]: It is apparent from Figure 2 and Table 1 above and Figure 3 and Map 1 below, the increasing demand for urban, rural settlement and industrial land. The urban areas have been expanding more rapidly due to internal rural to urban migration as job seekers have been flooding there to seek better income opportunities. Besides, people losing out assets from river erosions and becoming destitute have moved to urban areas seeking work, shelter in slums and public places and also livelihood opportunities. Given that most economic opportunities are in Dhaka and Chittagong, the migration has been most pronounced in these two city areas, though we also this other urban areas. The growth of urban centers has moved parallel with growth of industry, particularly the spectacular growth of labor intensive RMG industry, and also service sectors, particularly banking and financial institutions that creates paid jobs and also caters to the need of the industry sector as a whole.

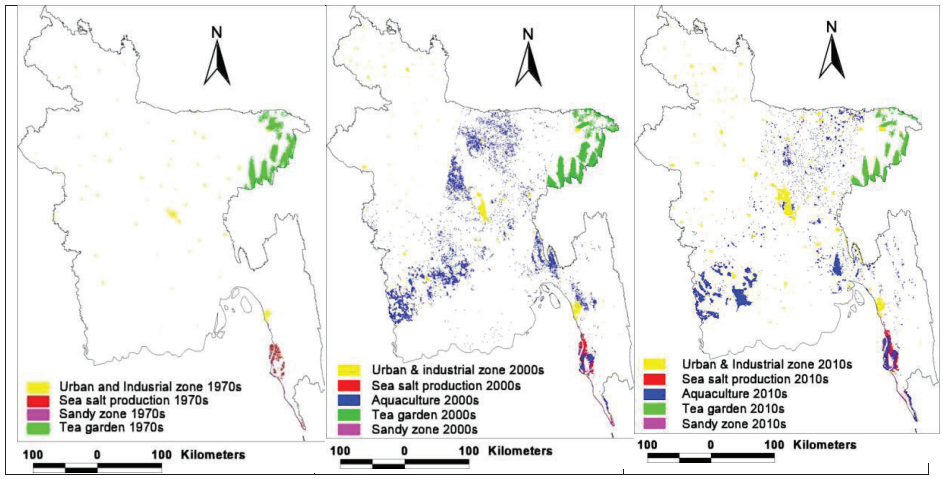
Figure 3: Change in Land Cover by Use, 1976 -2010 (Area '000'ha)



Source SRDI, 2013and Baseline Study BDP 2100

27 BDP 2100
28 BDP2100 Land Resource Management

Map 1: Maps Showing Urban and Industrial Zone, Salt Pan (Sea Salt Production), Sandy Zone And Tea Garden Of Bangladesh



Source: SRDI, 2013 and Baseline Study BDP 2100.

Urban and Industrial land use increasing: There has been significant increase in urban and industrial areas of the country between the period 1976 and 2010. The total urban and industrial area was 26,799 hectares (267.99 sq.km) in 1976 that expanded to 47,495 hectares (474.95 sq.km) in 2000 and dramatically increased to 87,616 hectares (876.16 sq.km) in 2010. The annual rate of increase was also higher (0.027%) during 2000- 2010, while the increase was only 0.006 percent during 1976 to 2000. The overall annual rate of urban and industrial area increase was 0.012% of the total area of Bangladesh, with an average of 4012 hectares (40.12 sq.km) of land being transformed annually to urban and industrial use between 2000 and 2010. The increased demand for urban and industrial land is a reflection of the growth strategies of the 6th and 7th Five Year Plans, where Bangladesh has made a strategic choice of moving to a higher growth trajectory of over 7% GDP growth per annum with manufacturing and industry taking the burden of this growth. Economic growth will continue to impact the spatial development.

This growth can be expected to continue at a faster rate in future and will require policies and strategic interventions that balances well the demand for land satisfying both industrial growth and food security. With the growth, urban lands prices will continue to skyrocket incentivizing developers, land grabbers to get hold of as much as urban land as possible, and distorting the market in the process. It will require proper spatial planning and zoning backed by laws, better taxation regime, digitized land management system, and proper enforcement mechanisms. The outcome should be optimum land use, higher land related tax revenues, and avoidance of distortion of the land market.

Failure to enforce existing urban zoning regulations because of the imperfect land market in the urban areas: Bangladesh urban areas are supposed to be regulated by existing zoning regulations. However, the zoning regulations by and large are not adhered to by users and not adequately enforced by regulators. So we see high-rise commercial building, shopping malls, schools, hospitals, markets are being constructed in designated residential zones, violating zone regulations. Water bodies are being occupied and filled

up violating different regulations. The Detailed Area Plan (DAP) has been limping around, with very little visible enforcement. Industries are being built anywhere land is found cheap, and encroaching and polluting on adjacent agriculture land. So only having zoning regulation may not be enough, but there will be need to put physical barriers. One aspect that has to go hand in hand in ensuring that industry and urban centers follow zoning regulations, while reducing incentives for encroachment into prime agriculture space should be to undertake what can be termed as "smart" investments in infrastructure and utilities, so that urban space and industry can only get built in the identified zoned places.

Growth of Megacities, Metropolis, other cities and towns: The fast growth in land use happened in urban areas which saw increase of number of urban centers (town and cities) from 63 to 522 in 2011. The period also saw growth of Dhaka as a megacity along with 04 other metropolises (defined as having population of 500,000 to 5,000,000). More recently we have seen a sharp surge in number of cities (defined as having population of 100,000 to 499,999) from 17 in 2001 to 38 in 2011.

Table 2: Historic Development of Urban Centers

Size Class	1921	1931	1941	1951	1961	1974	1981	1991	2001	2011
Small Town (Below 25,000 Inhabitants)	43	49	42	45	53	65	411	402	385	
Medium Town (25,000-99,999)	5	7	15	16	21	37	68	102	116	
City (100,000-499,999)	2	2	2	2	3	4	10	14	17	38
Metropolis (500,000-5,000,000)	0	0	0	0	1	2	3	4	3	4
Megacity (More Than 5,000,000)	0	0	0	0	0	0	0	0	1	1
All Urban Centres	**50**	**58**	**59**	**63**	**78**	**108**	**492**	**522**	**522**	

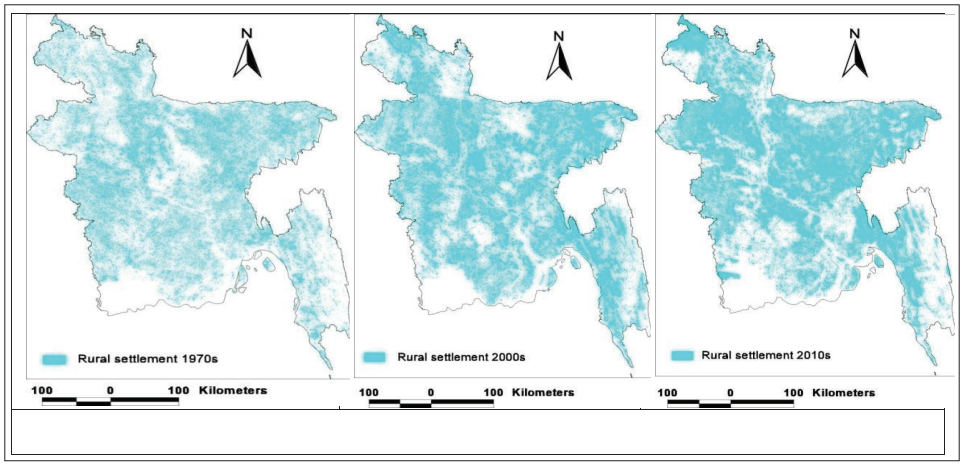
Source: CUS (2014)

Transformation in rural areas with increasing homesteads and business related built-up areas. While urban expansion has been catalyzed by the related economic needs, there has also been transformation happening in the rural areas not only because of growing population, with increasing land need for rural settlements (Map 1 above and Map 2 below). Rural Settlement [29] includes homesteads, rural markets and small business related settlements, homestead gardens and pond. Rural settlement was estimated at 8, 85,637 hectares in 1976 occupying 6.11% of the total area of the country. Rural settlement area consistently increased since then at a faster rate and became 12 % in 2010. It is estimated that while annually on an average 23,850 hectares of land went to rural settlement between 1976 to 2000, it surged sharply to 30,809 hectares between 2000 and 2010. [30] The land policy in future needs to factor this need and look for innovative land use solution like what is now being proposed as "My Village My Town " concept.

29 SRDI, 2013.

30 The figures on the basis of the study of SRDI by Hasan et. al. and the urban area size shown in BBS data are different as explained earlier. So the rural and settlement areas here in all likelihood include the peri-urban areas.

Map 2: Maps Showing Rural Settlements of Bangladesh



Source: SRDI, 2013

"My Village My Town" concept and need for supporting Zoning regulations: The fast growing rural settlements and what is increasingly becoming visible is some sort of rural urbanization that is horizontally expanding with increased need for rural housing resulting from growing young population with higher incomes to spend on rural housing. There needs to be strategic direction backed up by regulations and proper institutional setup that could lead to some form of land pooling to meet housing, another rural needs keeping most of other land free agriculture or other economic activities.

The government's initiative of *"My Village My Town"* has the intention to intensify non-farm land uses, like rural housing, markets, etc., to non-farm lands and is a timely one that needs to be explored. A comprehensive zoning of the country could help pave the way for regulating and institutionalizing implementation of such focused rural urbanization and this could be the backbone of achieving the strategic goal of the government's *"My Village My Town"*.

There had been effort undertaken to enact law on something similar to the *"My Village My Town"* concept in 2011. The government of Bangladesh is reported to then have had prepared a draft law, titled *" Draft Agricultural Land Protection and Land Use Bill in 2011"*[31]. Under that proposed law, non-farm occupation (i.e., construction of housing, industry, shrimp hatchery, brickfield) of arable land is strictly prohibited with necessary enforcement initiatives. The bill, though not acted upon, was aimed at bringing villages under prudent 'zoning principle', and had proposed the mandatory confinement of non-farm land uses to the existing non-farm lands. In addition, the draft bill had explicitly discouraged any alteration of the existing landscapes including rivers, canals and marshlands that should be exclusively protected for fisheries and rainwater retention.

The *"Draft Agricultural Land Protection and Land Use Bill of 2011"* had at its core the notion of density-control in rural areas as the future major policy instrument. Densification of the rural non-farm settlements in order to protect agricultural land was made explicit

31 M. Ashraful Alam, Rumana Asad, Md. Enamul Kabir -Rural settlements dynamics and the prospects of densification strategy in rural Bangladesh,

throughout that draft document. The bill principally had encouraged the compact development strategies for the existing non-farm lands to ensure maximum utilization and minimum wastage of spaces. Acquisition of land for infrastructure had been advised to keep the minimum. Most importantly, 'vertical extension' of rural dwelling spaces has been advised as a priority measure for new built-forms conforming local development plan, rural characteristics, and the environment.

While this has been a good initiative, and something similar Law and regulations could be considered, it needs to proceed with caution and should move through piloting. The reason is that, historically rural settlements of Bangladesh had never undergone such radical and formal planning intervention, and there is also no institutional mechanism available at this point. This proposal of a compact vertically extended rural settlements seems apparently incompatible to the highly informal and relatively disperse rural settlements systems. There have been researchers [32] who have experimented the concept in two villages, and they have made some cautionary observations while undertaking vertical village urbanization that needs to be factored in. *So, this very novel idea of "My Village My Town" should be taken forward as part of a comprehensive zoning strategy with caution, and piloting it and with full confidence of the rural population through effective consultations, routed through the Union Council.*

5.2 Land Use pattern impacted by continued erosion and accretion of Land – Diluvion and Alluvion

Riverbank erosion and accretion of land, except some hilly areas in the southeast and the northeast of the country, are common in Bangladesh. The country loses about 10,000 ha of land to river erosion every year. The erosion is particularly severe along the Jamuna and Lower Meghna rivers. This loss of land in a land scarce country has serious socio-economic impact. Erosion of the bank on one side and formation of char on the other are the recurring acts of the river systems. As a result, every year, a significant area of fertile lands and settlements are being lost due to riverbank erosion process. Such loss of landmass (Diluvion) and formation of chars (alluvion) has also resulted in challenges in land governance and implementation of regulations and laws relating to particularly regulating the rights of ownership of such lands. Erosion process leads to the displacement of people, and land capture and illegal settlements are prevalent in areas where the land is accreting. Formations of new chars, also, are not necessarily favorable for land use management. Burial of standing crops by fresh sediments of sandy deposits (sand carpeting) also destroys crops. These processes also have dramatic consequences in the lives of people living in those areas.

5.3 Land Reclamation in the Coastal zones is a real possibility but will require ways for ensuring good governance while planning land use

There is great potential of increasing land area along the coast of the country. Since 1973, land has been accreted in the Noakhali coast at a rate of 18 sq.km/year. It is projected that by the year of 2050, a land mass of 1,000 sq km can be raised. [33] The process of reclamation can be accelerated through variety of means. If it can be done in a sustainable manner then the country will be greatly benefitted by the extra land.

32 Rural settlements dynamics and the prospects of densification strategy in rural Bangladesh - A. F. M. Ashraful Alam, Rumana Asad & Md. Enamul Kabir

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Along with this opportunity, there are some key challenges of how to increase land area of the country along the rivers and coast in cost effective manner and how to optimize the land use, and avoid capture by the powerful. Other challenges will include in innovating ways for restore soil health, and put check on the threat of salinity intrusion and desertification. Of course, the BDP 2100 has already identified this issue of land reclamation and also has strategies for overcoming the different governance and institutional challenges. The Coastal Zoning policy 2005 could be revisited to adapt to this strategic thinking.

A strategic option in this regard is to consider adapting spatial planning along with comprehensive zoning laws and regulations. Zoning along with comprehensive spatial planning could help move towards desired land use se system. The importance of spatial planning as an instrument to guide development in Bangladesh has already been underlined in several policy documents including the 7th FYP and the BDP 2100.

5.4 Spatial Planning for facilitating optimal land use and need Land Zoning

Spatial Planning is an activity centered on making decisions relating to the location and distribution of land use activities. One of the main objectives of Spatial Planning is to ensure that the utilization of land resources is planned and implemented in an organized manner to meet the needs of present and future generation. Spatial Planning requires an integrative and comprehensive planning approach in order to rationalize the appropriate land use activities. The key role of spatial planning is to balance the different demands in order to ensure a rational arrangement of the activities and the linkages between them, and to ensure that competing policy goals are reconciled. [34] Spatial planning enhances the integration between diverse disciplines that includes use of land, fisheries and forests, urban, regional, transport and environmental planning.

Land zoning prescribes where, what, and how development occurs on the land. It is the process of dividing land into zones (e.g. residential, industrial etc.) in which certain land uses are permitted or prohibited, is also a regulatory tool for the government. Zoning can be a tool for government in stimulating, facilitating and regulating social, economic and environmental development, taking into account the interests of different groups of stakeholders and socio-economic and environmental potentials and vulnerabilities. It could include regulating kinds of activities which will be acceptable on the identified zones (e.g. among open space, residential, agricultural, commercial, or industrial needs), the densities at which those activities can be performed (from low-density housing such as single family homes to high-density such as high-rise apartment buildings), the height of buildings, the amount of space the structures may occupy, the location of a building, the proportions of the types of space, such as how much landscaped space, traffic lanes, and whether or not parking will have to be provided. Thus, through zoning, governments can ensure the proper use of land and avoid mixing incompatible land uses.

During the 8th FYP period spatial planning, as tool for optimizing land use, along with enforceable zoning regulations should be in place so as to ensure that the utilization of land resources is planned and implemented in an organized manner to meet the needs of present and future generation. Having an up-to-date zoning system is therefore essential not only in supporting the coordination among agencies, but it also will allow government agencies to effectively enforce proper use of land and avoid mixing incompatible land uses.

34 Spatial Planning in the context of the Responsible Governance of Tenure - This course is funded by the European Union through the EU-FAO Improved Global Governance for Hunger Reduction Programme. 2015

There will be challenges in implementing zoning practices across the country, and will require sufficient citizen/stakeholder consultations and their buy-in to this practice. Zoning to be successfully commonly will need to be implemented through active participation by local government institutions such Purashhavas, Upa Zilla Parishads, and backed up by enabling legislation and regulations. Different countries while undertaking spatial land related planning has instituted zoning laws. South Africa has promulgated a comprehensive Spatial Planning and Zoning law that can be used as a reference.

6. Land Governance

Land administration is not a new discipline. It has evolved out of the cadastre and land registration areas with their specific focus on security of land rights. Land administration has four functions (land tenure, land value, land use, and land development), and the cadastre plays a key role in this process as the engine of any land administration system. As presented in an earlier section, Bangladesh has long been having a well-structured legal framework related to land administration; and for implementation of the property rights related objectives that those laws envision there are in place along with supporting rules for enforcement.

However, it is the processes (which makes access to information difficult for common person), and inadequate transparency in the enforcement and application of processes that are behind the different land related problems. As a result, a majority of the civil and criminal cases in different courts has its roots in the procedural flaws and inadequate transparency in enforcing land rights. Moreover, land rights are insecure in large measure because of a not so efficient but expensive, and corruption-prone system of land titling and registration [35]. Access to land is inequitable. In rural areas 89% of landowners own less than 1 hectare, and thirty-nine percent have less than 0.2 hectares. The number of landless households is growing [36]. With such high numbers of marginal holdings makes the poor people owning those lands susceptible to land grabs by the influential, and also not being able to adequately participate in the land market because of non-transparency involved in different regulatory processes. Since the poor lack other assets, access to land is more important to them and better land governance could help them.

Land governance, thus, is caught up within a maze of social, economic, and political power interplay in Bangladesh. An effective, transparent, and well functioning land governance system could be support achieving the development goals, since it will allow better enforcement of property rights, transparent property transfers, and thus be catalytic in increasing investment levels, financial sector activity, and also improve scope for meaningful decentralization.

6.1 Institutional Framework Governing Land Policies, Land Rights, Land Survey, and Land Registration

At the core of governance are the institutions, and so there needs to be a better understanding on the roles and responsibilities of the public institutions governing the land sector. This will help pave the way to unbundling of the issues relating to the functioning of the land market and the regulatory and institutional impediments there. However, as will be discussed later, there are multiple agencies' involved with land management focusing on

35 (GOB BS 2008; Uddin and Haque 2009; USAID 2010; ADB 2004c; IMF 2005; ANGOC 2001; USAID, 2010)
36 (USAID, 2010)

their particular goals and objectives. The MoL and its four agencies (described below) are the principal institutions responsible for ensuring Record of Rights to a land property, but there is also the Registration Department under the Ministry of Law Justice (MoLJ) is responsible for registering sale of property, and documents from both these places creates the full record of rights. This creates coordination challenges and resultant challenge in proper information flow. There needs to be reliable and complete information on land and property right, which should be made easily available to interested parties. Access to land information would then allow for low-cost verification of land-ownership status, which in turn would form the basis for low-cost land transfers to more productive use or users and may facilitate the use of property as collateral in financial markets.

Record of Rights and other areas of land administration: The principal government body, which administers the land law and promulgates related rules and regulations or deal with housing, land and property is the Ministry of Land (MoL). The main activities of the MoL are to update records of government owned khas lands, Sairat Mohal (water bodies, sand bodies, shrimp cultivated lands etc.), distribution and management of vested and abandoned lands, undertaking land surveys and establishing the ownership of land. Beside this, land acquisition and requisition, distribution of khas land among the landless are also prioritized activities of this ministry [37]. The Ministry is responsible for collection of land development tax and also responsible for record keeping, overseeing land-use planning, implementing land reforms, and managing government land development programs.

The Structure of Ministry of Land administering the Record of Rights Process: The MOL have the following four Agencies implementing different aspects of the land related laws: (i) Land Administration through the Field Administration under Divisional and Deputy Commissioners, (ii) Land Appeal Board, (iii) Land Reform Board and (iv) Directorate of Land Record & Survey (DLRS).

I. The field **land administration**, that comprises the offices under the Divisional Commissioner's, the Deputy Commissioner, and the AC (Land) is responsible for record keeping and updating, protection of public land-water bodies, Khas and water body management. It also deals with land tax fixation and collection, land transfers and land acquisition for public interest. It leases out public land and water body for limited year, is in charge of implementing the sharecropping law, and identifying alluvial or dilluvial land.

II. **The Land Appeal Board** is responsible for the determination of appeals against decisions of concerned government officials on land issues, namely land taxes, mutation or records update, and land ownership and boundaries as reported in land registration certificates (khatians) and maps (mouza). After receiving judgment from the Appeal Board, people, if not satisfied, still has option to make appeal at the District judge court, which is the first step of judicial procedure.

III. **The Land Reform Board** is mainly responsible for enforcing land reform laws, monitoring its implementation processes, facilitating study or collecting citizens' demand on any reform related to land management or administration. Accordingly the Board makes suggestions, recommendations or proposes alternative laws and sends them to the Land Ministry. Accordingly, the Ministry takes the initiative to reform issues.

37 From MoL website – linked to Finance Division document referred there.

IV. **The Directorate of Land Record & Survey (DLRS)** is responsible for conducting land surveys and creating individual land registration certificates (khatian) and maps (mouza) for each parcel of land, and make records according to the position/ possession and documents. According to the manual, they concentrate more on position/possession then documents. DLRS do not correct position/possession and documents but only does prepare new map and records accordingly. DLRS is still using tools that had been in use during the past decades, though recently some digitization of land record has been introduced only at very limited scale, and the process is very time consuming as will be discussed below.

Land Registration: While overall land administration and management is the realm of the Ministry of Land (MOL), ***a very key fragmented part relating to ensuring property rights, that is property transfer through registration is under the jurisdiction of the Ministry of Law and Justice (MOLJ).*** This operates at district level by District Registrars and by Sub Registrars at Upazilla level. The Department of Registration records land transactions for the registration of land ownership changes arising from land recording (through the Sub-Registrar's Offices across the country) and collect the Immovable Property Transfer Tax. According to Bangladeshi law, the following forms of transactions are required to be registered: leases for more than one year or from year to year; freehold transactions relating to common law, such as transfers or subdivisions; and the granting of 99-year government land leases (khas).

Land Management relating to setting up of Economic Zones: To ease land-related problems faced by potential investors, the Government had enacted Economic Zone Act in 2010. Prior to that the Government had also enacted the EPZ Act, Private EPZ Act, and the Hi-Tech Park Authority Act. These Acts provides legal basis for the establishment of economic zones, export processing zones, and hi-tech-tech parks 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.

Other institutional structures governing land management, particularly in relation to agriculture, water resources, urban development and industrialization: It should be noted that are few other Ministries and their agencies, which are also in the land governance structure, dealing with particular aspects relating to land resources management. The Ministry of Forest and its agencies deals with forest land; the Ministry of Fisheries deals with management of water bodies relating to Pisciculture. The Ministry of Water Resources and its agencies, particularly WDB also deals with land management including the accretion of land as a result of WDB investments. The Ministry of Works through its agencies like RAJUK, CDA, KDA, RDA, etc. dealing with urban land, and the Ministry of Roads and Highways with land along the roads. So land administration related laws traverse across ministries based on particular needs with the overarching laws, particularly governing property rights, title, lease rentals falling in the realm of MOL.

7. Constraints and Challenges of Land Resource Management - Coordination Issues Relating to Policymaking, and the Regulatory and Institutional Challenges

There has been ever-increasing pressure on land resources, given its finite nature and competing demand for land use, with problem aggravated by institutional and regulatory constraints. It is deemed as the safest asset to hold and pass on for inheritance, and also the fastest way for appreciating the wealth of a person. This wealth aspect has also been the source of conflicts and clogging up of the court system by cases that are land related. Moreover, land ownership inequality remains a problem in Bangladesh and is at times exacerbated by land grabs by some unscrupulous people preying on opaqueness created by prevailing institutional bottlenecks. Land transactions are relatively high cost (containing a high proportion of informal costs), and disputes about authenticity of land rights are caused, among others, by the inefficient and dispersed land records system.

Because of the competing demand on land use, and because of its scarcity there is speculative land pricing in an otherwise a very inefficiently functioning land market. As a result, land markets do not function efficiently and there is lot of opaqueness in its different aspects which leads to problems that people, particularly poorer people, regularly face when making any land related transactions. For land markets to operate efficiently there needs to be a legal and institutional framework that clearly defines the rules for allocation of property rights and, by allowing cost-effective enforcement, encourages and facilitates land-related investment. Of particular importance will be to implement a well coordinated institutional system that will be substantially digitized to provide efficient and timely service.

It will be critical to further build up on what has so far been achieved on the institutional, regulatory, and technological front during the 8th FYP for a more sustainable and efficient land management to facilitate achieving the vision that has been expressed through the 6th and the 7th Five Year Plans, the 2041 Perspective Plan, and the BDP 2100. The constraints are discussed below in details.

7.1 Institutional Constraints

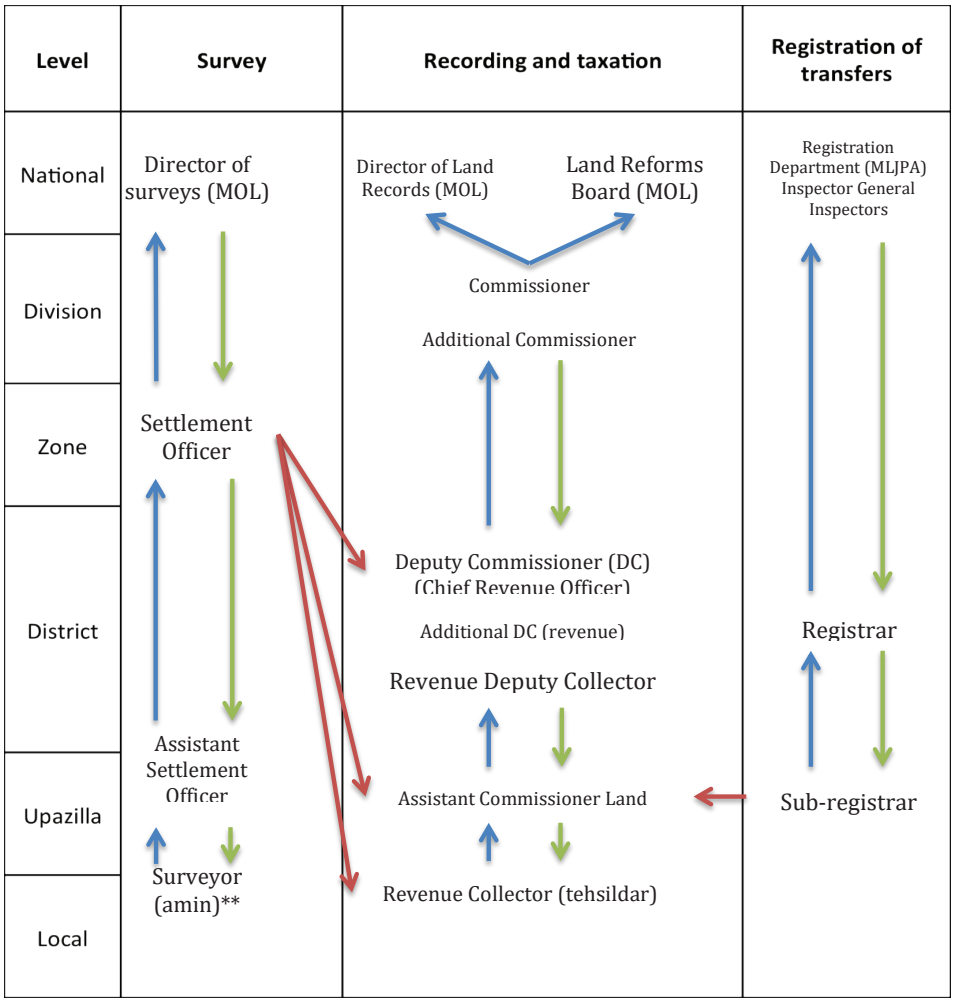
It is evident from earlier discussions that the institutional coordination, which impacts policy implementation, is a key challenge and constraint that has to be addressed urgently. The problems lies in the multiplicity of government institutions and the working process, and so requires more in depth understanding of the institutional constraints, and addressing ways for mitigation constraints. There are two different strings of the coordination challenge. The first is between the MoL and MoLJ and the agencies under them, and second is intra-agency coordination within MoL

Inter-Ministerial Co-ordination Issues: Among the institutional constraints is the lack of coordination among different departments responsible for preparation and maintenance of Record of Rights (ROR) that often leads to confusion, conflicts and many instances of litigation causing suffering of the people especially the small and marginal farmers. As had earlier been discussed the government has been making efforts to mitigate this problem, and as part of it the Ministry of Land, as already discussed above, has been undertaking projects during the 6th and 7th FYP periods, including efforts to move to digital surveys and introduction e-governance. Land records have been planned to be computerized and land mutation to be made automatic.

Intra-MoL coordination Issues. One factor that becomes apparent is that the links between the three key institutions, the Survey, The AC Land, and the Sub-Registrar's office, are very weak as accountability mechanisms only moves vertically in each of the institutions, though for a efficient and transparent system there needs to well synchronized linkages across the three institutions. The issue gets further complicated as two of the agencies report to Ministry of Land the Registry is within the jurisdiction of MOLJ. So there has also to be good synchronization between the two Ministries. The reliability of land related certificates (khatian) and maps (mouza), gets undermined by the fact that there are several government agencies involved in the process of determining land ownership and the required process for registration of the property and poor coordination between them.

Understanding the Institutional Coordination Challenges: The Land Administration and Registration Organization Structure in Figure 4 below (also see the Figure at Annex 3) is a good starting point to understand the complexity of land administration and the challenges to governance. In the short and medium term, the regulatory and institutional challenge will be in bridging these gaps across the institutions as well as brining efficiency within each agency. It will be particularly important to reduce time for undertaking surveys, simplifying the appeal process, reducing the number of days in the registration process to at least come to the India level, which had also inherited a similar system, and finally coming up with a more dependable and readily available certificate of title that is protected from abuse that is now prevalent in the system.

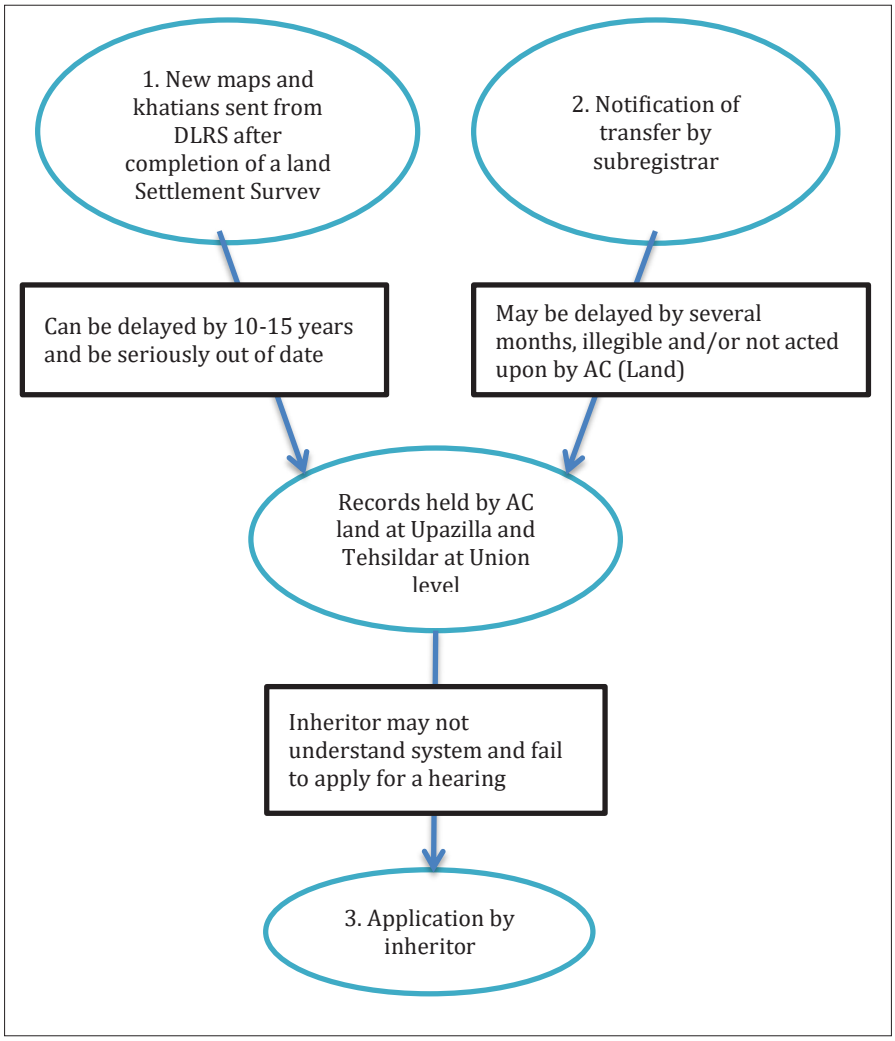
Figure 4: Creating and Maintaining Land Records at Sub-national level: Key Roles, Reporting Lines and Supervision.



Regulatory maze aggravated by institutional complexity. It is evident from the above schematic chart (Figure 4 above) that the land administration moves in a parallel way among three institutions – the Director of Surveys though the Settlement Officer, the Director of land records thorough Deputy Commissioner and Assistant Commissioner (AC Land), and Inspector General of Registration through the District Registrar and the Sub-Registrar. Land related complications arise because the Land records may be updated: (i) as a result of land surveys (via the Settlement Officer); (ii) (via the sub- registrars office) registering of deeds of sale; and (iii) through inheritance (through AC land office). The

process of updating land records is shown in Figure 5 below. Each of this units have there own time frame of completing their individual tasks, which can be a cause for lack of adequate transparency when dealing with the citizen.

Figure 5: Updating of Land Records



The issues can be further unbundled by analyzing the processes involved in land transfer and those in updating the land titles, both of which are linked; and the outcomes are dependent on how well coordinated is the functioning among each of the three institutions. Each can easily prove problematic because besides time required in each of the processes, among the three there is only information sharing mechanism, and accountability is only vertically established in each of the three departments. The diversity of ways in which land records may be updated, and the problems associated with each give rise to numerous disputes and also proliferation of land related civil and criminal cases, in which the rich and powerful inevitably enjoy the upper hand.

Land Transfer and the Land Registration Process and the official Costs. Land transfer is undertaken through a process by which the land gets registered and the registration document gets handed over to the new owner. The land registration is a complex and time-consuming process. The Doing Business indicators log this process – the number of steps, the time taken and the costs. For example, registering a transfer of freehold land in Dhaka will take about 245 days, require a payment of 10 percent of the purchase price and involve eight different procedures. These procedures are generally too difficult for ordinary people to follow without legal or some other form of assistance, and too expensive for urban poor people. This gives rise to rent seeking opportunity in the concerned government offices and exacerbate the cost of land registration. So there are policy and regulatory challenges in this aspect especially from transparency point of view.

While the ***Registration process*** apparently has clearly laid out steps, the problem is within those steps, and as a result it becomes very difficult for the average citizen to navigate through those maze of steps and processes without the support of intermediaries, which also leads to informal payments. The land transfer process (also see Figure in Annex 2) involves the necessity of the buyer to crosscheck the authenticity of title with AC Land office before registration of transfer. While the Registration process could become faster with better synchronization of its processes with the AC Land/Tehsil office work, but in reality the following are likely to happen: [38]

- "Some transfers occur on an entirely unofficial basis, perhaps when land is mortgaged, but this is becoming less common.
- Some buyers may not try to check the AC records first., and even if they do, these may well not be up to date.
- The deed writers and Sub-Registrar collude to ensure that this step only proceeds if a bribe is paid first, whilst the buyer and seller may also collude to reduce the amount of Immovable Property Transfer Tax (IPTT). There is no requirement to check the legality of the transaction and it is not uncommon for the same plot to be "sold" to several different buyers, although this is much more frequent in urban areas
- Once the transfer is registered the authorized deed is supposed to be issued within a month, but frequently takes a year and the payment of a bribe.
- Once the transfer is registered the land transfer record is supposed to be sent to the AC Land office immediately, but is also subject to delays of several months. Notifications are frequently illegible.
- The AC (Land) generally does not update the record unless informal payments are made.

Land Survey. Land survey is an important ingredient in updating of land records as evident from Figures 4 and 5 above. The survey, which leads to Settlement, is seen as a temporary process where only certain parts of the country are covered at particular points of time. The Table 3 below shows time span of a typical land survey along with administrative responsibility and completion rate at each stage. It could very well take 15 years to complete in one part of the country.

38 CARE. 2003. Land policy and administration in Bangladesh: A literature review. Rural Livelihoods

Table 3: Land Surveys, Coverage, Administrative Responsibility and Rate of Completion

Level	Operating in 1997 (a)	Span of control (b)	Average coverage	Persons responsible (c)	Average rate of work
Zone	12	(17-18)	2-3 districts	Zonal Settlement Officer (ZSO)	12-15 years to complete
Upazilla	209	(5-6)	125 square miles	Assistant Settlement Officer (ASO)	5-10 years to complete
Mouza	1150		1.33 square miles	*Amin* + 2 chainmen	1.5 per season

Source: CARE Report

(a) Settlement is seen as a temporary process where only certain parts of the country are covered at particular points of time. (b) The average number of *Upazillas* per Zone and *Mouzas* (Revenue Villages) per *Upazill*. (c) For details of responsibilities see Figure 4 above.

The steps involved in the process are listed below in Table 4. A very important regulatory process is preparing khatian (record of rights)- the form giving plot numbers-, the khatian number, classification of land (that affects land revenue), area, crops grown, name of owner, agricultural practices along with a mouza map. This is done through periodic cadastral surveys. As evident from the Table 4 below, this cadastral survey administered by Directorate of Land Records and Surveys (DLRS) itself could take 15 years to finish, and by the time it gets completed lot of the land features may change, especially in riverine areas and major urban centers where frequent changes of ownership take place. The time required in each step of the survey at a particular location is shown in Table 4 below. The cadastral survey starts with creating the initial maps by very low paid, low-level temporary employee, the Amin.

Table 4: The Land Survey Process

No.	Steps	Time Taken
1	Survey (kistwar) and mapping by amin & 2 chainmen	3 – 4 months
2	Preliminary record (khanapuri) writing by amin	
3	Local explanation (bujharati) by amin	
4	Attestation (tasdik) → Re-survey may be ordered	From 6 months to 2 years
5	Draft publication of Khatian by amin	
6	40 % → Hearing of objections by ASO? Kanungo? → 10%	1 month
7	80% / 30% → Appeal to ACR or TNO & ZSO	6 months
8	Final checking (janch) by amin	6 months
9	DLRS prints map and ZSO prints khatian	More than 10 years
10	Records handed over to Upazilla and Union	

Table 4 (Continued)

1.	**Cadastral survey (kistwar)** ♦ Amin and 2 chainmen to draw revised mouza map showing changes in area, location and characteristics of land ♦ Followed by demarcation of boundaries	♦	These are temporary junior staff. Insecurity and low pay affect morale, performance, accuracy and reliability ♦ They have to depend on the local elite for board and lodging during season and are thus open to their influence
2.	**Preliminary record writing (khanapuri)** ♦ Display of notices and beating of drums summons owners, neighbors and interested parties to khanapuri at which each claimant presents their case ♦ Amin fills up the columns of the khatian (record of rights) form giving plot number, khatians number, classification of land (that affects land revenue), area, crops grown, name of owner, agricultural practices ♦ Khatian also officially contains information on tenancy since 1984 Land Reform	♦	Poorly paid field workers are again susceptible to bribery here ♦ In practise tenancy is rarely recorded because of pressure from the rich
3.	**Local explanation (bujharat)** ♦ Amin hands draft khatian over to the "owner" and entries are explained		
4.	**Attestation (tasdik)** ♦ Tehsildar, assisted by clerk, hears ♦ from each owner, listens to any disputes and, if satisfied, attests the khatian by signing it in red. ♦ Otherwise a re-survey may be ordered	♦	60 may be attested in a day, but there are particular backlogs at this stage. It may take two years to clear the work of one field season
5.	**Draft publication** ♦ Senior amin records all details on a draft khatian and presents certified version to "owner" ♦ Regarded by villagers as culmination of the exercise		
6.	**Hearing of objections** ♦ Where objections arise, cases heard by ASO with decisions recorded in violet	♦	Mid level staff have few chances for promotion and extra field allowances that used to be provided have been stopped. This encourages corruption
7.	**Appeal** ♦ ZSO and ASO hear appeals at Upazilla ♦ Some referred on to District level where decisions marked in black.	♦	Long delays caused by shortage of suitably qualified staff to hear appeals

8.	**Final checking (janch)** ♦ Entails map correction, amalgamation and splitting up of jamas (interests) by the permanent surveyors and their supporting staff	♦ As documents about to be dispatched for printing, powerful local people often intervene to lobby for changes
9.	**Printing and publication** ♦ Formerly both khatians and maps were printed centrally at DLRS presses ♦ Zonal offices now produce khatians, which has speeded process, but maps continue to be printed centrally ♦ Compositors names are now printed on khatians which has significantly reduced tampering at this stage	♦ Methods antiquated and equipment obsolete ♦ Newly promoted, inexperienced officials given responsibility for complex tasks ♦ Khatians and maps arriving heavily exceed capacity to process, causing increasing backlog (estimates of size of which vary widely)
10.	**Handover of records** ♦ Once completed, copies of the ROR are passed to DC, thana and union land offices for land management with originals retained at district under lock and key ♦ Records are then updated as a consequence of sale and transfer through mutation process (see Section 5) ♦ Tehsil registers are not freely open to inspection, but for payment of a small fee, land owners are formally entitled to a certified copy of the ROR and mouza map	♦ Local officials unable to keep records updated. (If they could, there would be no need for revisional settlement) ♦ In practice a substantial bribe must be paid to access registers, effectively restricting access to the better off

Source: CARE Report

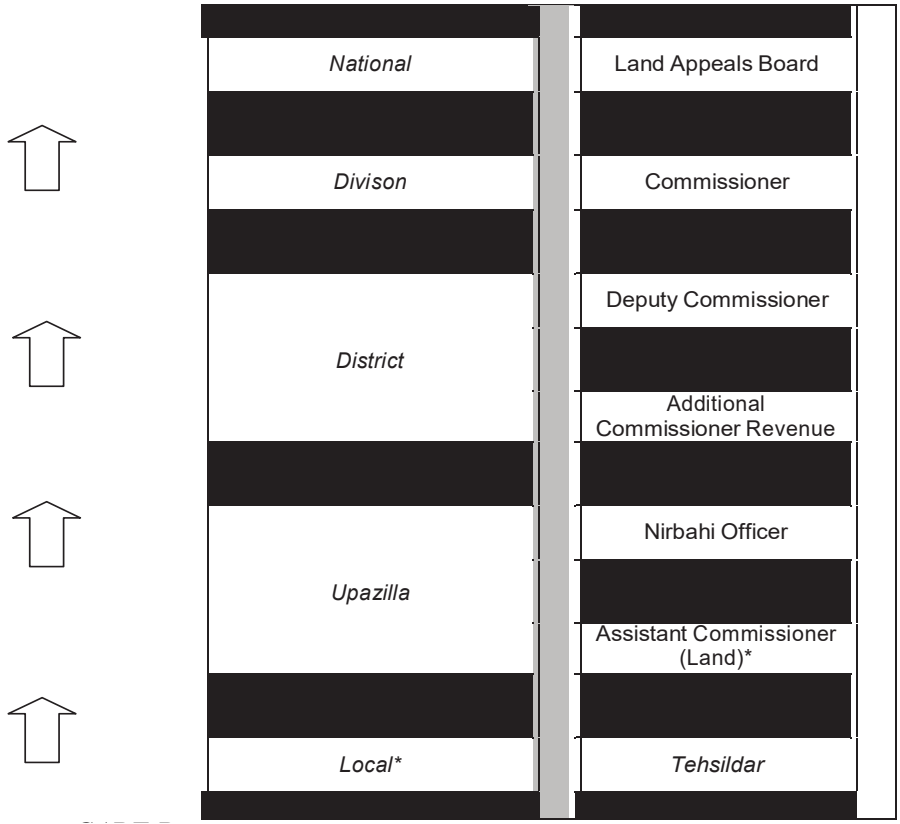
Land governance challenges with in the processes: The Tables 4 and the two Figures (Figure 4 and 5) above on the land title and transfer process clearly spell out the regulatory challenges affecting land governance. It is difficult for any average citizen to fully understand and navigate through this maze, and taking advantage of such non-transparency arising from complexity of processes the citizen has to depend on informal intermediaries, and also it provides scope for producing fake documents

The Table 4 also highlights the institutional and governance challenges facing the critical survey part of land administration. For example, the Amin has to depend on boarding and lodging with some influential people in the village which runs the high risk comprise the authenticity of maps and draft of the khatians.

The survey process and the appeal process are themselves also lengthy. The survey process itself could take anywhere between 6 months to 2 years, depending on whether a re-survey is ordered. There is definitely scope for improvement here if necessary regulatory steps and institutional changes are brought in backed up by use of technology. Similarly the scope for reducing Appeal time and steps needs to be looked into. There is process for review and rectification but the appeal process could take a long time and also costly. Where a decision relating to the recording of land title is disputed, the appeals process

starts at the lowest rung of the ladder represented in Table 5 and then moves progressively upwards until the appellants and other interested parties either accept the judgment given or lack the resources to proceed further.

Table 5: The Appeals Ladder



Source: CARE Report

In the short and medium term, the regulatory and institutional challenge will be in bridging the gaps identified across the institutions as well as brining efficiency within each agency. It will be particularly important to reduce time for undertaking surveys, simplifying the appeal process, reducing the number of days in the registration process to at least come to the India level, which had also inherited a similar system, and finally coming up with a more dependable and readily available certificate of title that is protected from abuse that is now prevalent in the system.

7.2 Other Challenges

Maintaining balance between food security needs and other needs with shrinking cropland: As had earlier been discussed that Bangladesh needs to continue to provide food security in the changing development context. A key challenge for optimum land use, as stated in BDP 2100, will be to be able to come up with a long-term sustainable healthy balance between land needs for agriculture and food security and that for urbanization, industry and rural settlements;

while at the same time maintaining integrity of life-support systems and its productive capacity is maintained. Part of this challenge can be mitigated through spatial planning and zoning, while at the same time undertake actions to ensure the soil conditions improve for crop cultivation.

Accretion and Reclamation related challenges: Bangladesh has scope to increase the land area of the country [39] along the rivers and coasts through accretion and reclamation while ensuring the integrity of existing river channels. A major challenge will be to having in place a sufficiently robust governance structure related to khas land management, particularly those resulting from accretion and erosion of land in the delta, so that it can be managed through spatial planning and enforced through zoning regulations.

Optimally Managing land through SEZs: To a great extent, the fate of SEZ initiatives gets determined from the outset, by the choices made in the establishment of policy frameworks, incentive packages, and various other provisions and bureaucratic procedures. The success of zones is also critically linked to how they are developed, managed, regulated, and where located. While there is a goal for establishing 100 SEZs across the country, it will be very important to prioritize them based on feasibility so that land doesn't remain unused because location is not right.

There seems to a proliferation of Zones Authorities, which raises institutional challenges. Besides BEPZA and BEZA, the Government has also set up the Hi-Tech Park Authority (HTPA) to develop IT related Zones. Beyond these there is the BSCIC, which has for long building and running Industrial Estates. There is also a separate Private EPZ Act governing the Korean EPZ, administered by a Private EPZ Cell located in PMO. For optimal land use for industrial zones it may be best to one single regulatory authority licensing setting up zones based on well defined feasibility criteria.

8. Priorities and Strategies for Sustainable Land Use and Spatial Planning

It is apparent from the analysis above that Bangladesh during the 8th FYP period will have to undertake reforms to improve and strengthen land resource management, for which appropriate time bound prioritized strategic actions is being proposed. Key strategic elements include institutional reforms supported by appropriate digitization of the systems, land zoning along with having spatial planning institutionalized, land related legal, policy, and regulatory reforms. All these can help achieve efficient land management system that is commensurate of an upper middle-income country (UMIC); and that which can be catalytic to achieving the desired goals of on agriculture, food security, industry and urban sector.

The broad objective of these strategies and priorities will, therefore, be to move towards establishing systems that can facilitate efficient allocation of land to the uses consistent with broader strategic development goals of the government particularly those expressed through the Vision 2020, the 6th and 7th FYPs, the Perspective Plan 2041, and BDP 2100; and that which also complements and is consistent with the goals of industrialization, urbanization, infrastructure, agricultural needs, particularly that of accelerated job creation, and sustained food security. The strategy will also propose process and direction that could also help facilitate moving towards achieving government's broad strategic vision of what has been coined as "My Village My Town" as a means to reduce the rate of increase in rural settlements.

39 BDP2100

8.1 Institutional Reform Strategies

Bangladesh has undertaken different land related reforms that have been supported by Laws and regulations. All the desired goals however could not be achieved because the vested interest have always been able to exploit legislative and regulatory loopholes and institutional under capacity. On the institutional front efforts were made to bring in change; for example, there was the *"Muyeed Committee Report"* that had recommended that functions of Land Registration (sub-registrar) and Record (tehsil) be brought together in a single office at field level, but it was never implemented because of political economy challenges though if implemented should have solved lot of the present problems.

However, some of it could be overcome if compressive computerization gets completed. The time for cadastral survey is also unduly long though new technologies are now easily available for completing this task efficiently and in shorter time.

Strategy 1: Digitization of the Land Management systems

Digitization of the processes and use of technology in AC Land, the sub-registrar's office, and the land survey under the e-Government program should be of highest priority. The target should be accessibility of information to the citizen, reducing unnecessary steps. However, it needs to be ensured that there is clear links between the different agencies so that desired results can be obtained. 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 up-gradation of land records, maintenance of all related data for each parcel of land makes land administration and management incomplete 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.) hinders land development control and property tax collection.

There is an ongoing effort of computerization of some of the processes in each of the three institutions (agencies), and the government during the 7th plan period had started on some digitization programs like E-mutation, Integrated digital land recording system (IDLRS), and Digital Land Management (DLM). While, these efforts were in right direction these instead of being undertaken in a more comprehensive way, was rather uncoordinated and based on limited individual Ministry requirements. For comprehensive automation of Land Administration and Management System, first and foremost will be need for clear understanding by the land officials of what should be the steps to reach the goal of some thing like a fully evolved and operational Digital Land Management System (DLMS), which has been tried during the 7th plan period. This will demand capacity building and training of existing government employees in the districts as well as information sharing campaigns on local AC Land websites and in-office demonstrations to the local citizens [40]. This will also require effective coordination between the concerned MoL and MoLJ agencies, but also within MoL, that is ***field land administration*** (comprising the offices under the *Divisional Commissioner's, the Deputy Commissioner, and the AC (Land)*), **the DLRS, Land Appeal Board**, and the **Land Reform Board.**

40 Land Automation Planning Brief by TerraTech Limited

A digital platform which can use an automatic online system for managing the land issues, and the resultant easy access to the online services can give the land owners and other stakeholders a well manageable interface through which they can get their land related services transparently, thereby making easy to enforce property rights. Sometime in future the availability of online system could be taken to a point when availability of online services can even provide the option to the individual landowner the facility to manage their land properties even from their homes. Moreover, online management of the land properties should help reduce the chance of corruption and reduce opportunity for land grab by the socially powerful, and reduce the courts burden of cases.

Improving technological know-how and user efficiency is therefore paramount to the success of any digital transition, which can be achieved in tandem with the initial development of the scanning of records by engaging all other stakeholders in the process. This needs to be a priority goal for the government, and a single strategy for implementation of all land related computerization should be undertaken. [41] Effective and well-coordinated computerization of each of the agencies under the two Ministries should be able to bridge the existing gaps and provide more readily available reliable information to the citizen, business, financial institutions, and to the courts. Besides the intrinsic value to the GoB in efficiency gains related to time, cost and personnel, the availability of such a system will have very positive impact on banks and financial institutions to overcome the challenges they face in efficient collateral based lending and can help in loan recovery process once it gets defaulted. This can be a good source of revenue from a digitally managed land management system. This definitely will help improve business environment in the country while also reducing scope of corruption at different levels.

For the short and medium term:

- Computerization/digitization of the processes and use of technology in AC Land, the Sub-Registrar's office, and the land survey (DLRS) under the e-Government program should be of highest priority. The digitization strategy needs to ensure that there are clear links among the different land management related agencies and implementation gaps are overcome, so that desired results can be obtained The target should be accessibility of information to the citizen, reducing unnecessary steps.

- The digitization system should be implemented keeping the following in perspective:

    - A new and revised National Land Use Policy (RNLUP) should ensure delivery of land related services to the people through modernized and efficient land administration.
    - Strengthening Access to Land and Property Rights to all Citizens of Bangladesh through development of Digital Information System (DIS).
    - To develop digital technique for the preparation of design and khatian using modern equipment (GPS, ETS, Data Recorder, Computer, Map Processor, Software, Platter, Printer etc.)

41 In Pakistan, the province of Punjab faced such a challenge. For many rural landowners in the province, land titles weren't easily accessible, nor were they properly managed and protected. To tackle the land administration challenge, the government of Punjab turned to an innovative solution: they used digital technology to modernize its old, inefficient paper-based land administration system. Supported by the World Bank, the Punjab Land Records Management and Information Systems (LRMIS) project turned out to be one of the success stories for the province of Punjab. Within just five years, Punjab scanned 10 million pages of old records, digitized over 55 million landowners' records—98% of all records—across the province, and made all rural land title information available online 24/7 for landowners.

- Strengthening governance management for land resources;
- Computerization of Existing Mouza maps and khatian;
- To ensure proper and planned wise land use; move to a spatial planning paradigm;
- To create authentic land record, it may be established with joint venture of AC (Land), settlements and Sub-Registry.

♦ The complexities of land management includes domain knowledge in digitization of property information and portal implementation in specialized areas in addition to legislative understanding of existing solutions, stakeholder engagement and other operational aspects. Project management is key to the success of the automation projects, overseeing practical work, engaging all stakeholders step by step and ensuring on the job training of key personnel.

♦ The Government can unify the different digitization processes, that it has been departmentally trying out, i.e., e-mutation, Integrated digital land recording system (IDLRS), and DLM projects for digitizing mouza maps, and expand to one which could be termed as Digital Land Management System (DLMS) for Bangladesh. It will be based upon a delivery in the target services digitally, which in turn will become the basis for a nationwide rollout.

♦ The proposed DLMS would need to be developed within the framework of a comprehensive master plan combining all aspects of land management along with a full scale "Enterprise Architecture", which can act as the foundation for achieving successful land automation. One factor that is apparent from earlier discussions is that the links between the three key institutions, the Survey Office, The AC Land Offices, and the Sub-Registrar's offices, are very weak as accountability mechanisms only moves vertically in each of the institutions, though for an efficient and transparent system there needs to well synchronized linkages across the three institutions. An enterprise architecture presents a logical design that can help incorporate all the institutions and processes currently standing in separate silos, preparing the way for a complete and comprehensive organization of information and governance which will lead to a single, unified solution for updating land-related information among the three core institutions managing the outcome on land property rights – (a) for creation of records handled by the office of the DLRS; (b) for maintaining and efficient delivery of record of rights and collection of land property taxes the AC (Land) office; and (c) the Sub-Registrar's office for registering the land property and collection of taxes and duties at time of registration. Of course the best scenario would be to have the Record of rights and land registration system under on one office to increase efficiency and reduce any chance of system loss.

♦ The proposed DLMS can then start off by piloting in identified Upazilas that will be representative of different types complexities and challenges in this regard. It should be fully resourced right from the beginning to facilitate unhindered effective full roll out across the country once the initial teething problems are identified and adjusted, and also ensuring that adequate training to officials to manage delivery of the results. A comprehensive DLMS if properly executed will not only meet the needs of all sectors of business, but should also facilitate international investments (FDIs), along with local investments. It will, e.g. provide opportunity to the people receive the Land Tax notices through online portals and to pay Land Development

and other property taxes through online system; facilitate applying for critical land related documents like the Khatian copy and receiving digitized certified copies in the process; and applying and processing of mutation requests (further development of the e-mutation that has already been initiated), and thus support achieve the goals of Digital Bangladesh.

- Because IT systems are dynamic and requires specialized human resources to maintain and run the system, it will be best to outsource this function to reputed, technically and technologically sound and well resourced IT firms through an efficient transparent contracting process under the PPP frameworks; where each risks will be well identified and allocated between the private vendor/service provider and the regulator/the government.

Strategy 2: Other Institutional Reform Strategies:

Some of the other institutional and policy related priority interventions that could potentially lead to a more optimal land resource management that supports the growth strategy of the Government, in a sustainable manner are as follows:

- **Revision of National Land Use Policy.** The NLUP needs to be revisited, and if required a new policy that should be framed that overcomes institutional gaps and is applicable across the MOL and MOLJ along with other Ministries (Urban, roads, water etc.), working in a comprehensively digitized environment. The necessity for revision of NLUP has been presented as a strategic goal of BDP 2100, with the guiding principles that it will have to help achieve appropriate and sustainable use of specific type of land, sectoral and cross-sectoral land use and effective environmental management. It particularly has to factor in 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. It has to be framed in ways it can avoid and overcome mandates that are either overlapping or difficult to coordinate.
- The revised NLUP, hereinafter referred to as RNLUP, should provide the framework that can lead to an effective across institutions communications, and that also have guidelines that processes, like digitization are made mandatory, so that most of the land ownership, land use, land tax, registration and other related information could get automatically updated limiting human interaction between officials of institutions and the citizens.
- The Policy should explicitly recognize that competing demand of food security and the need for poverty alleviation, creating jobs and providing housing, infrastructure. In this context among other issues, the following needs to be considered:

    - Policy should support value added use of accreted land along major rivers as well as reclaimed land along the coastal zone that can effectively answer long-term urban, infrastructure and industry needs.
    - Growth center based development activities to be included in the land use policy of the rural areas for optimal utilization of land, and should be such that it is amenable to the "My Village My Town" concept;
    - Consider the case for introducing some sort of land ceiling for homestead in both urban and rural areas, particularly through compact township, that would be supportive in future possible implementation of the "My Village My Town" concept;

- The land use policy should ensure proper management of saltmohal, jalmohal, balumohal and other mohals for poverty reduction. On the other hand it should ensure protection and conservation of wet lands, hilly areas, tea gardens, heritages, and rubber gardens including coastal land;
- Policy should include a provision to ensure environmental protection and protection from the adverse effects on climate change on global warming;

♦ ***Zoning needs should be articulated more clearly in the RNLUP:*** The Land Use Policy should explicitly recognize that competing demand of food security and the need for creating jobs and providing housing, infrastructure, and explicitly, and as support for that should make provision spatial planning and zoning related laws and regulations. The Government has enacted the Economic Zones Act to facilitate use of land for industry and services. However, a more articulated policy is required which would lead to zoning of the entire country. The information that will get generated from a country-wide mapping exercise could be used to create land use based zones, for which the proposed Revised National Land Use Policy (RNLUP) should specifically have provision, so that the land use gets distributed optimally to meet the competing and sometimes complementary needs.

♦ ***Align the RNLUP with other related cross-sectoral policies.*** The cross-sectoral policies of 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 revised and comprehensive land use policy.

Strategy 3: Spatial Planning and Compressive Zoning

♦ ***Country wide land mapping:*** There needs to be a full mapping of the country to determine which land will be exclusively kept for agriculture and which for industry, housing, roads and there should proper zoning laws with institutional enforcement in place. Even Government's future infrastructure and urban related investments should be built in a way that it caters to desired zoning needs of the country. *In this context nation-wide Land Zoning Map that had started in 100 Upa-Zillas under a project implemented by the Ministry of Land*, and which has slowed down, needs to moved forward in a comprehensive way, backed by adequate resources, and should be linked to the overall land digitization strategy.

♦ Formulation of Spatial Planning and Land Resource Management Act. Bangladesh needs to consider giving legal coverage to spatial planning by putting some like "Spatial Planning and Land Resource Management Act", as had been proposed in the BDP2100. In this context other country experience can be used as has been the South African law can be an example. [42] Given the scarcity of land resources, having in place such a spatial planning Act will be a rational way of addressing the land use related challenges. Spatial Planning Act will allow focus on spatial pattern/ distribution of land-uses/resources, which will better help in achieving the strategic objectives of food security, accelerated job creation, rapid urbanization, and also addressing challenges from climate change.

42 South Africa – Act No. 16 of 2013: Spatial Planning and Land Use Management Act, 2013

- The Government has enacted the Economic Zones Act 2010 to facilitate use of land for industry and services. Land zoning process could be covered through a Spatial Planning Act, as prosed above. South Africa has instituted effective Zoning Law as part of spatial land related planning that can also provides for formation of small village townships keeping good agriculture land from being used for home steads, and also clearly demarcating where industry can be built.
- Such Zoning policy backed by a spatial planning law could be used as a regulatory tool to pilot and test out the concept of ***"My Village My Town"*** to see if small village townships can be actually created to help keeping good agriculture land areas depleting. However, this is a new issue and will require intensive stakeholders consultations, and involvement of the Union Parishads. In future this aspect of zone regulations should be exclusively passed on to the Union Parishads.
- Local government institutions also will have to be strengthened to effectively regulate and enforce land use as per RNLUP and any land zoning law that gets enacted. The core institutions that can regulate this initiative are the local government tiers, particularly the Union Parishads and in some cases the Upazila Parishads. Besides, in future there needs to be in place physical barriers to help reduce incentives for horizontal expansion for housing and other no-farming activities like shops and other businesses that are resultant of rural urbanization needs. A possible physical barrier is not expanding the penetration of rural roads and electricity and other utility services, but instead provide those in areas where village township areas are to be built under the concept of ***"My Village My Town"*** initiative.
- More specifically the zoning objectives should particularly be rolled out specifically for accruing and reclaimed land, and this should come under spatial planning so that land use is done as per zoning specification to provide for urban centers, ports, including where possible deep sea port, roads, railways, airports, industry, and agriculture. The ongoing Coastal Zoning exercise should become part this process to optimize on land reclamation and mitigating climate change related challenges.
- The proposed RNLUP and the supporting zoning and spatial planning framework should be used in ways that the Special Economic Zone (SEZ) Act 2010 can be used to set up new urban industrial and urban centers in the newly accreted or reclaimed land. As identified in BDP 2100, for example, the accreting and reclaimed land along Jamuna, Padma, and Meghna rivers or any other major river needs to be protected and used as part of spatial planning in making value added land use by setting up of new SEZs. This will require huge infrastructure investments and only public investments will not suffice, and where feasible private investments through transparently and appropriately contracted PPPs should be sought.

Strategy 4: Other Legal, Regulatory and Policy Reforms relating to land management.

- ***Khas land related policies need to reviewed and revised*** and the following points may be considered during review and revision of khas land policy [43]:
  - Local level khas land management and distribution committees should have representatives from landless people – women and men. They can be executive committee members of local level development projects.
  - Involvement of poor people (women and men) of the locality in the identification, selection and utilization of khas land should be strengthened.

43 BDP 2100

- Ministry of Land should arrange awareness-raising activities for women and men about their rights and procedures to get khas land including land settlement procedures. Coaching on filling out application forms to get khas land is a real necessity. Gender Focal Point and Climate Change Focal Point of the concerned Ministries could implement specific programmes towards this.
- Displaced population (male and female) due to river bank erosion should be rehabilitated on the newly accreted chars and khas lands. Legal procedures in these situations should be gender-friendly.
- Women should be recognized as 'farmers' considering their huge involvement in farm land.
- Property inheritance right should be established considering equality of women and men; and for establishing women's rights.
- Ensuring ownership of land in the name of women even though they do not have a mature son; and for enforcing this, necessary policy revision is important (Reference- Agricultural Khas Land Management and Settlement Policy 1997).

♦ ***Revision required in Land Acquisition Related Law and Policies:*** The Land Acquisition and Requisition of Immovable Property Ordinance, 1982, which has roots in the British colonial Land Acquisition Act of 1894 presents significant challenges in its application, as it is based on compensation rationale only, and the concomitant resettlement process. There will now be need for revision of land acquisition policy and law to align with the objectives and goals of the proposed advent of RNLUP, spatial planning and zoning reforms, so that land use is optimally undertaken.

Strategy 5: Need for public sector reform on land management as longer-term policy and institutional reform,

♦ Undertake a comprehensive public sector reform involving Ministries/ Institutions involved in land governance. These should help in evolving a regulatory and institutional framework that could make the land market more efficient, and mitigate the intra- and inter-ministerial and related agencies coordination. During the 8th FYP and beyond, efforts need to go beyond land administration and into broader land management. Land management, which is broader than land administration, should cover all activities associated with the management of land and natural resources that are required to fulfill political objectives and achieve sustainable development, with all institutions working through a synchronized platform. There is, therefore, articulation of the need for necessary measures to be initiated for ensuring sound coordination of the activities undertaken by department of registration, AC (Land) and DLRS offices. Through appropriate delineation of supervisory responsibility of settlement activities, better coordination of the two offices in dealing with the preparation and maintenance of land records at the upazila level will have to be achieved. The Directorate of Registration will have to remove inconsistency in land records management, and also measures need to be taken for immediate updating of land titles. The issue of putting land registration and AC (land) work under the same umbrella needs to be re-visited. These should help in evolving a regulatory and institutional framework that could make the land market more efficient.

Annex 1

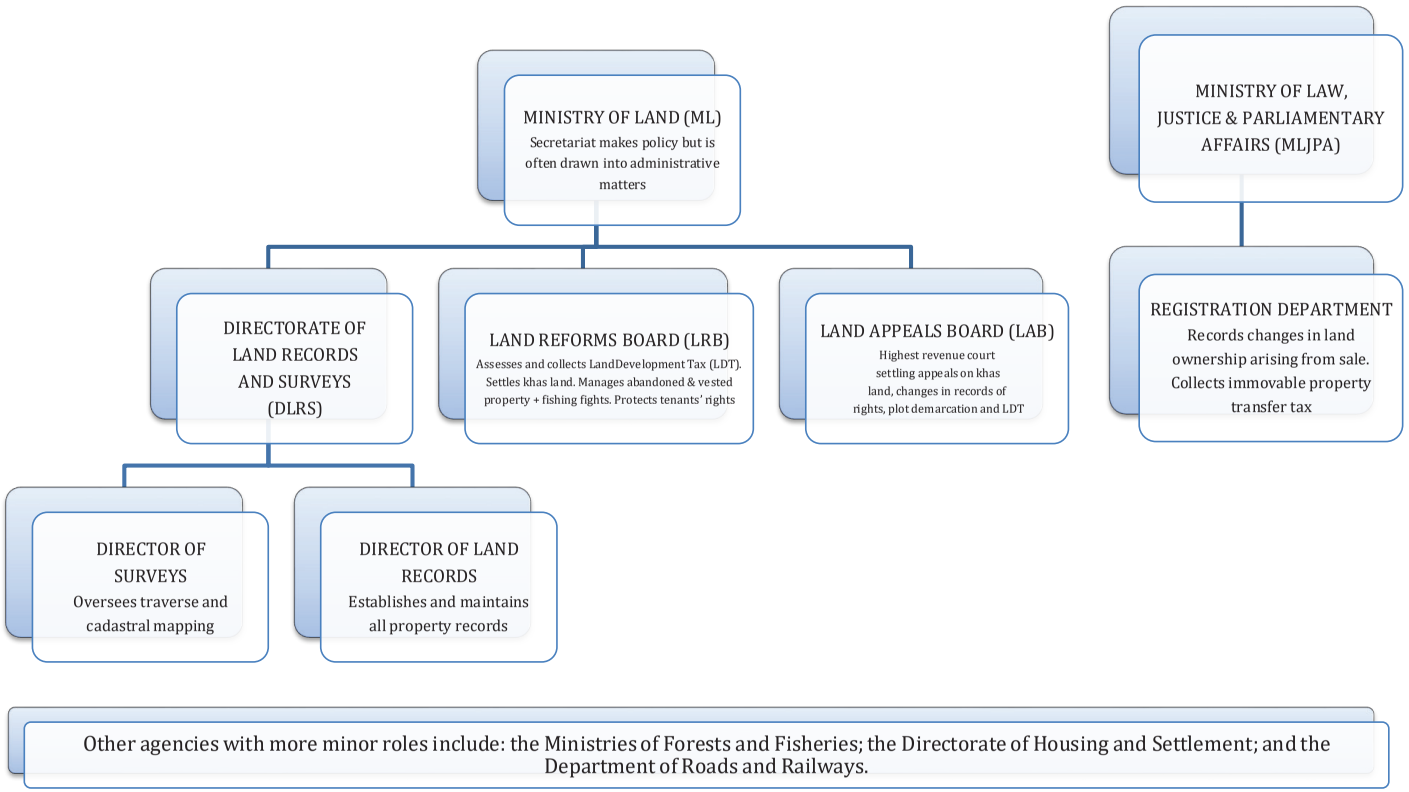
Historical List of Land related reforms

1950	Abolition of *Zamindari* system. Control of land passes to the Revenue Department, which subsequently becomes the Ministry of Land (MOL).
1951	East Bengal State Acquisition and Tenancy Act (EBSATA) 1951 promotes the goal of retaining the agricultural character of land by giving cultivators first right of purchase and prohibiting other use; but the large number of exceptions and poor enforcement dilute impact. A land ceiling of 33.3 acres is imposed.
1950-early 70s	A leftist movement targets landless poor and marginal farmers, but whilst land reform continues to excite the popular imagination, little is done by way of implementation.
1956-62	A State Acquisition Survey is conducted based on the CS blueprint
1961	Land ceiling raised to 125 acres
1965-	Survey and revisional settlement operation commences, but progress is very slow and by 1995 it has only been completed in 10% of all *thanas*
1972	A land ceiling of 33.3 acres is re-established and various presidential orders provide for the distribution of *khas* 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 *khas*. 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. *Benami* (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.

Bangladesh period **Annex 1 (Continued)**

Late 1980s	Muyeed Committee recommends that functions of Land Registration (sub-registrar) and record *(tehsil)* 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 *Thana* 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 Khas Land Management and Settlement Policy introduced.
1998	Total khas 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 *de facto* private control arising from informal local settlements.
2015-20	Estimated date for completion of survey of land rights.

Annex 2


MINISTRY OF LAND (ML)
Secretariat makes policy but is often drawn into administrative matters
MINISTRY OF LAW, JUSTICE & PARLIAMENTARY AFFAIRS (MLJPA)
DIRECTORATE OF LAND RECORDS AND SURVEYS (DLRS)
LAND REFORMS BOARD (LRB)
Assesses and collects LandDevelopment Tax (LDT). Settles khas land. Manages abandoned & vested property + fishing fights. Protects tenants' rights
LAND APPEALS BOARD (LAB)
Highest revenue court settling appeals on khas land, changes in records of rights, plot demarcation and LDT
REGISTRATION DEPARTMENT
Records changes in land ownership arising from sale. Collects immovable property transfer tax
DIRECTOR OF SURVEYS
Oversees traverse and cadastral mapping
DIRECTOR OF LAND RECORDS
Establishes and maintains all property records
Other agencies with more minor roles include: the Ministries of Forests and Fisheries; the Directorate of Housing and Settlement; and the Department of Roads and Railways.

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Study 10 :
Urbanization Challenges, Strategies and Way Forward

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1. Introduction

The United Nations Centre for Human Settlements (UNCHS) in its Global Report on Human Settlements (1996) underlined the importance of urbanization by stating that "Urbanisation has been an essential part of most nations' development towards a stronger and more stable economy over the past few decades and it has helped underpin improvements in living standards for a considerable proportion of the world's population." The view that cities are engines of growth is now well recognized. The state of the World's Cities Report – 2001 prepared by UN-HABITAT showed that a strong and positive correlation exists between urbanization and the level of economic and social development. Analysis of macro data in different countries support this generalization, since the countries that have experienced the most rapid economic growth rates also have higher urbanization levels whereas those with slower growth rates continue to have a large percentage of their labour force engaged in agriculture, and have relatively low levels of urbanization. In fact, no country has ever reached upper income status without a significant population shift into cities.

Bangladesh has been experiencing rapid increase in its urban population ever since its independence in 1971. Urban population as a percentage of total population increased from about 8 percent in 1974 to nearly 29 percent in 2011. The trend still continues and by the year 2050 nearly 50 percent of the population of the country is expected to be living in urban areas. What is worrying, however, is that such rapid urbanization has been accompanied by deteriorating situation of housing and other infrastructure and worsening of quality of urban life due to air, water and noise pollution. Slums and squatter settlements have become integral part of urban life while paucity of drainage and sewerage facilities and extreme traffic congestion are standing on the way to improve livability of cities. Based on such experience policy prescriptions tend to emphasize slowing down urban growth and drastic reduction in rural-urban migration. It is believed that combating urban growth would alleviate problems accompanying such growth. This conviction although seems logical is not well-founded.

Studies have shown that the process of urbanization, if badly managed, is accompanied by adverse social, health and environmental consequences. The way that cities are managed and administered has a direct bearing on their ability to combine safe and healthy living conditions that can improve quality of life for all citizens, including the poor. "It is not the fact of urbanisation or the size of cities or the speed at which they are growing that is the problem, but rather that the undesirable effects and impact of urbanisation can be worsened by the way that cities are managed" (Mumtaz and Wegelin, 2001: Guiding Cities, the UNDP/UNCHS). Proper and effective management of cities and towns can not only prevent or reduce the negative aspects of urbanization but also can unleash their tremendous potentials to perform efficiently as centres of economic growth and development.

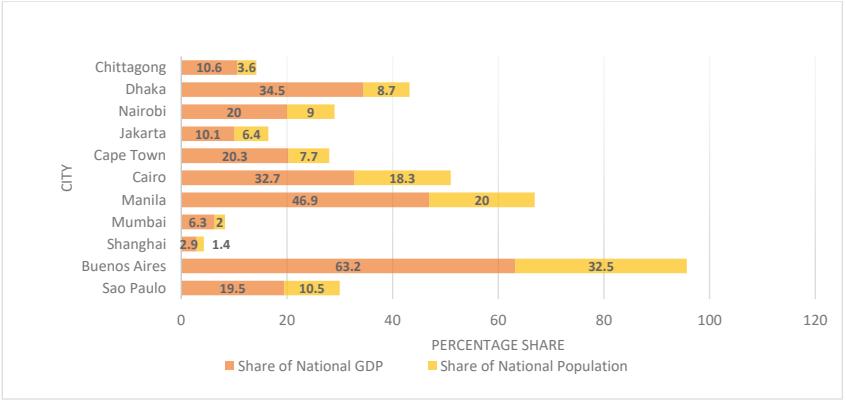
2. Urbanization and Economic Development

2.1 Economic Role of Cities

The role of cities in national economic development is now well-established. Today, cities play a central role in creating national wealth, enhancing social and economic development, attracting direct foreign investment and manpower, and harnessing both human and physical resources in order to achieve gains in productivity and competitiveness. In a recent study, Trujillo and Parilla (2016) have shown that 123 largest metro areas in the world accounts

for about one third of global output with only 13 percent of the world's population. These cities are located in developed as well as in developing countries. Higher urban productivity is more prominent in developing countries where cities are more productive than their rural counterparts. Although rising levels of urbanization and rapid population growth in large cities have often been considered problematic, the fact that major cities generally have a significantly higher concentration of the nation's economic output than its population is well-founded.

Figure 1: Share of National Population and GDP in Different World Cities



Source: WDI Database (World Bank); UNHABITAT (2011)-Economic Role of Cities; Economist magazine, September 12, 2019

Cities are now the predominant hubs of economic growth and wealth creation. The lure of employment opportunities existing in the cities is a reason for urban migration. In Bangladesh millions of people have benefitted from the process of urbanization as the agriculture sector is no longer able to absorb the surplus labor force entering the economy every year. Inability of the agriculture sector to provide sufficient employment or sufficiently high household incomes to cope with a growing number of dependents can encourage people to seek employment outside agriculture. In the case of Bangladesh, rural-to-urban migration has contributed to more than 40 percent of the change in urban population.

Household income is found to be much higher in urban areas than in rural areas. Report of the household income and expenditure survey, 2016 (BBS, 2017) indicated that monthly income per household in urban areas was about 70% higher than the household income in rural areas. Cities also offer other advantages that are important for achieving sustainable development. Higher population density associated with urbanization provides an opportunity for governments to deliver basic services such as water and sanitation more cost-effectively to greater numbers of people.

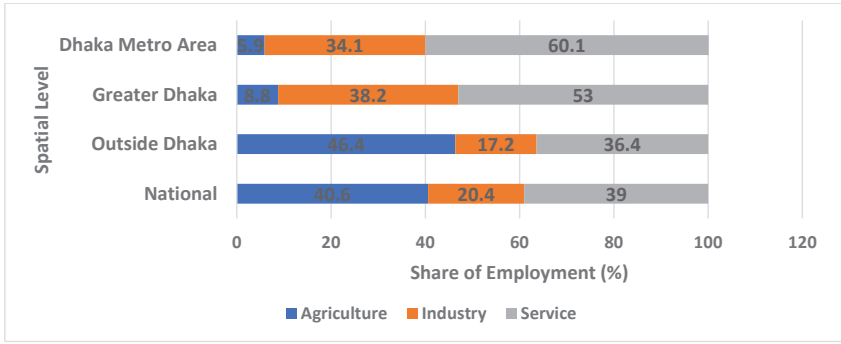
Cities not only offer various types of advantages to the city dwellers, but also facilitate country-wide development. As urban centers prosper, they provide new markets and increased demand for goods produced elsewhere in the country. Also, a portion of urban earnings are often cycled back to the countryside by way of remittances. Further, the gains in human capital and new technologies, while initiated in urban areas, often spread countrywide. Thus, urbanization can be a driver for national growth reaching all areas.

2.2 Economies of Agglomeration and Urbanization

Although rising levels of urbanization and rapid population growth in urban areas have often been considered problematic, it is a fact that these areas generally have a significantly higher concentration of nation's economic output than their population. High concentration of national economic production in urban areas is usually explained in terms of localization and urbanization economies (also known as agglomeration economies). Localization economies arise from many firms in the same industry locating close to each other. There are three sources of localization economies: the first is the benefit of labor pooling which is the accessibility that firms have to a variety of skilled laborers, which in turn provides employment opportunity for the laborers. The second benefit is the development of industries due to the increasing returns to scale in intermediate inputs for a product and the third source is the relative ease of communication, supplies, laborers and innovative ideas due to the proximity among firms. Urbanization economies, on the other hand refer to advantages gained from an urban location. These include proximity to a market, labour supply, good communications, and financial and commercial services such as auditing, advertising, investment, industrial cleaning, and maintenance. Larger cities have a greater comparative advantage than small ones. The bigger the city the more likely is the match between specific demands and supplies.

Most of the industrial establishments and businesses as well as business services are concentrated in the largest cities. The domination of business services, particularly finance and real estate services is considerably higher in the four major cities relative to the rest of the country. [1] Dhaka alone accounts for 80 percent of the garments industry-the mainstay of manufacturing in Bangladesh. It is quite clear from figure-2 that the proportion of people engaged in non-agricultural employment in Dhaka Metropolitan Area or Greater Dhaka is much higher compared to the rest of the country or the nation as a whole. In Dhaka Metropolitan Area, for example, industrial and service employment accounts for about 34% and 60% of the total employment respectively while in the country as a whole only 20.4% of the employed people are engaged in industrial sector and 39% are employed in the service sector. Such percentages are even lower outside Dhaka (whole country excluding Dhaka). It is very likely that the localization and urbanization economies were mainly responsible for the agglomeration of activities in these major urban centers of the country.

Figure 2: Share of Employment by Sectors



Source: Ahmed Ahsan (2019): "Dhaka centric-growth: At what cost?" in Policy Insight, November 2019, Policy Research Institute (PRI), Dhaka

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An idea about the degree of agglomeration of activities in a city can be obtained by assessing the position of that city relative to the nation in those activities. For gauging the relative specialization of Dhaka Metropolitan Area in various sectors or activities we computed the location quotients (LQ) for Dhaka in those sectors. The LQ for each sector (for example, sector A) in the city can be derived from the following ratio:

LQ = Percentage of city employment in sector A ÷ Percentage of national employment in sector A

If the LQ is greater than 1, the city is more specialized than the nation in sector A. The city is less specialized than the nation if the value of LQ is less than 1. The degree of specialization of the city and the nation in that sector is the same if the LQ is equal to 1. Table 1 presents the location quotients for Dhaka Metropolitan Area and urban areas of Bangladesh for various sectors for the year 2013.

If the LQ is greater than 1, the city is more specialized than the nation in sector A. The city is less specialized than the nation if the value of LQ is less than 1. The degree of specialization of the city and the nation in that sector is the same if the LQ is equal to 1. Table 1 presents the location quotients for Dhaka Metropolitan Area and urban areas of Bangladesh for various sectors for the year 2013.

It is quite clear that The Dhaka Metropolitan Area has heavy concentration of non-agricultural activities. The degree of concentration is high in construction, real estate and renting while considerable concentration is observed in manufacturing, utilities, transport and communication, financial institutions and health and social works. Similar results have also been found elsewhere [2] using a population weighted specialization index. In this case lower the value of the index for a given city, the less specialized is the city and greater is the presence of agglomeration economies in that location. As seen in table-2, relative to the smaller cities (with population less than 500,000), the index has lower value for the four largest cities in Bangladesh, suggesting diversified economic structures in these cities.

Table 1: Location Quotients for Dhaka

Sectors	Location Quotient	
	Dhaka Metropolitan Area	All Urban Areas Combined
Manufacturing	1.332	1.065
Electricity, Gas and Water Supply	1.141	1.581
Construction	2.820	1.809
Transportation, Storage and communication	1.337	1.282
Bank, Insurance and Financial Institution	1.243	1.404
Real Estate and Renting	3.273	1.684
Health and Social Works	1.295	1.410

Source: Author's calculation based on BBS 2013 Economic Census Data

Table 2: Index of Diversification

City Size (Population)	Manufacturing	Overall
5 million + (Dhaka)	0.19	0.28
500,000–5 million (Chattogram, Khulna, Rajshahi)	0.07	0.2
Less than 500,000	0.4	0.5

Source: Bangladesh: Strategy for Sustained Growth, World Bank (2007)

2 Bangladesh: Strategy for Sustained Growth, World Bank (2007).

2.3 City Competitiveness

As the cities are now considered as engines of economic growth, countries are now striving hard to make their cities competitive to attract investment and create jobs that help reduce poverty and unemployment. Many developing cities have been able to do so by focusing on strategies to achieve higher productivity, greater capital intensity, higher levels of human capital, and a greater density of hard and soft infrastructure. For example, Singapore, Hong Kong, and Bangalore (India) have been able to make their economies globally competitive by moving away from an emphasis on low-cost infrastructure, low labor costs, and low taxes, toward fostering growth in high value added industry clusters using skilled workers, advanced strategic infrastructure and innovation.

Policies and strategies to improve competitiveness of a city nationally or internationally requires careful analysis of what makes it competitive. The Asian Development Bank (ADB) developed the City Cluster Economic Development (CCED) approach that allows national and local governments to analyze the competitive positions of their cities. ADB applied this analytical framework to assess competitiveness of top 10 cities in Bangladesh—Dhaka, Chattogram, Khulna, Rajshahi, Sylhet, Barisal, Rangpur, mymensingh, Bogra, and Comilla (ADB, 2011). Sixty-two percent of the total urban population of the country is in these 10 cities. Assessment of competitiveness of these cities was based on six key drivers—the cost of doing business, the dynamics of the local economy, the availability of human resources and training, the availability of infrastructure, the government's responsiveness to business needs, and the quality of life—were used in the competiveness assessment. Each driver had several attributes, and each attribute had a number of indicators. Each city was scored separately.

Dhaka emerged as the most competitive city in Bangladesh with a total score of 7.31 out of 10 which was not unusual given its population size as well as its role as the most important administrative, commercial and industrial centre in the country. Chattogram, Sylhet, and Comilla had the next-highest scores. Six of the 10 cities were not competitive nationally (their index scores are below 5). These cities produce mostly for local consumption. Chattogram, Sylhet, and Comilla are considered competitive nationally, but they have a long way to go before they can have more export-oriented, and internationally competitive, economies. None of the cities studied are internationally competitive (index score of more than 7.5), although Dhaka is competitive internationally in some sectors, mainly in textiles and garments.

2.4 International Experience

2.5 Globalization and Industry Cluster Development

Globalization has now created opportunities for national and multinational companies to move to locations that offer competitive advantages in the production of goods and services and access to markets. Agglomeration economies resulting from availability of common infrastructure, skilled labour, research and development facilities, connectivity to national and international markets etc. make it possible for large firms to cluster together. Highly specialized clusters of large ICT firms in Bangalore, India or chip manufacturers in Bangkok, Thailand are examples of this type of development.

Another example is Santa Rita do Sapucai, a small city in Brazil. It is now known as the country's own Electronic or Silicon Valley on account of its technological skills and innovation. The city is now home to 141 technology-based companies and is one of the main electronic clusters in Brazil and even Latin America. The city has become highly competitive because of its strategic positioning. The companies developed a strategy for innovation and development of more complex products and services rather than relying on general, non-sophisticated products. The government and the local university also played significant role in the development of this cluster. The university launched research programmes to support the industries while the government extended funding and policy support.

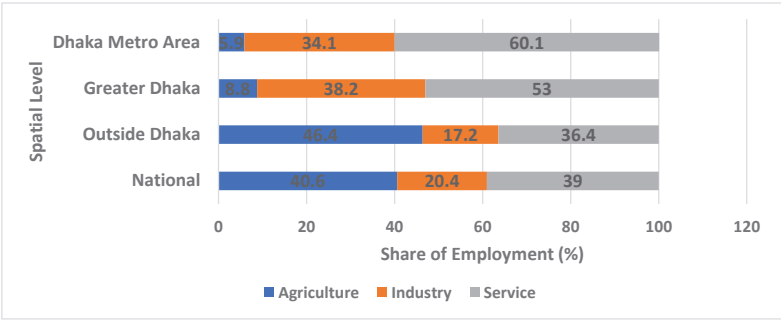
The concept of City Cluster Development (CCD) has also been used for integrated urban and industrial development in some countries. Foshan and Guangzhou cities in China applied this concept to form a prosperous city cluster by developing high-quality infrastructure, technology and industrial parks to attract leading manufacturers to the Pearl River delta region. The approach is largely supply-driven, with a strong emphasis on good logistics systems, integrated industrial development complexes and high-quality access to services.

3. Patterns and Trends of Urbanization in Bangladesh

3.1 Spatial and Temporal Patterns of Urban Growth

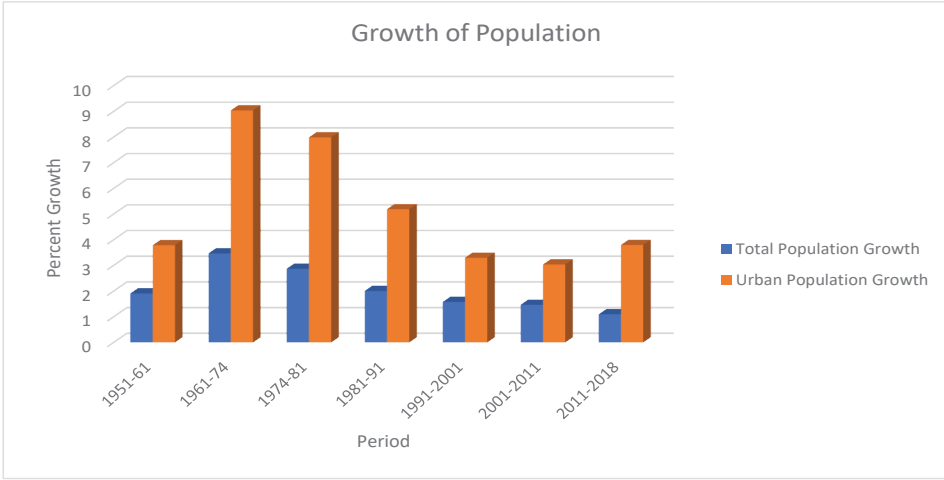
Bangladesh is a lowly urbanized country if compared with high income countries but its rate of urbanization is one of the highest in the world. Urbanization in the country has been more rapid during recent decades. In 1961 the urban population was 2.6 million or only 4.8% of the total population. The figure reached 22.45 million or 20.15 percent of the total population in 1991. By 2011 around 29 percent of the country's population became urban residents. More than 60 million people was estimated to be living in urban areas of the country in 2018 accounting for about 36 percent of the country's population (Figure-3).

Figure 3: Level of Urbanization in Different Years



Source: Population Census, 2011, UN-World Urbanization Prospects (WUP) -2018 Revision for 2018 estimate

Figure 4: Growth of Urban and Total Population

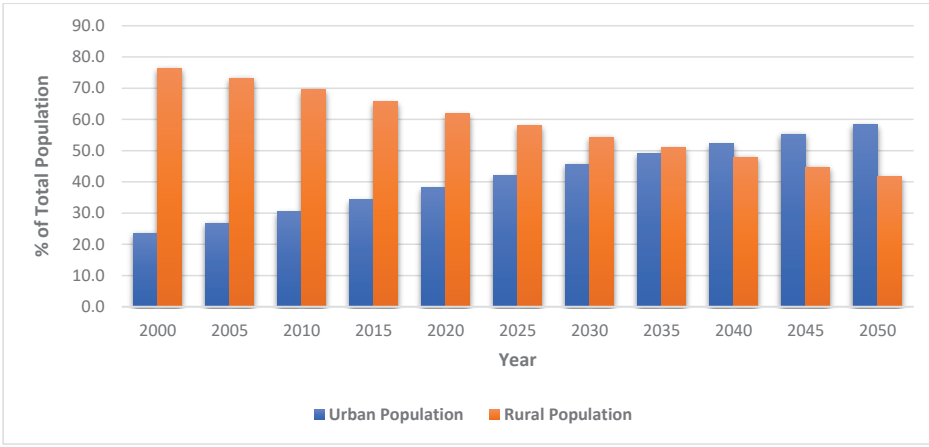


Source: Population Census, 2011, WUP-2018 Revision for 2018 estimate

The population division of the United Nations estimated that nearly 58% people of Bangladesh will live in urban areas in 2050 (Figure-5). This is indicative of the fact that growth of urban population and labor force is increasing relative to rural population and labor force. In fact, the annual exponential growth rates of population in the urban areas in Bangladesh have consistently outpaced the growth rate of total population in the country in each and every census conducted in the period 1951-2011 (Figure-4 above).

An examination of the level of urbanization and share of national urban population along with total urban population for each of the six divisions reveals that Dhaka Division overwhelmingly holds the highest rank in all the census years both for level of urbanization and share of national urban population. On the other hand, the rank of Sylhet Division was the lowest for both of the above-mentioned cases.

Figure 5: Percentage Distribution of Urban and Total Population Upto 2050



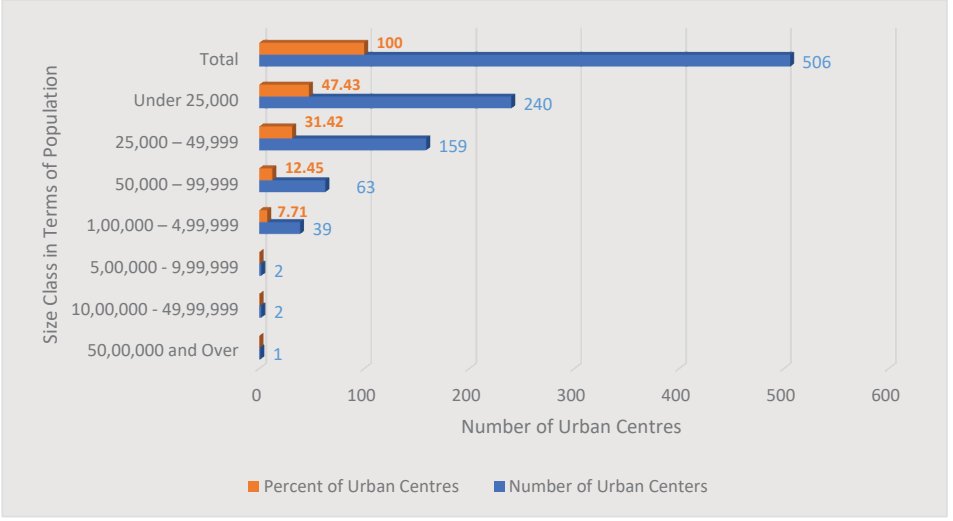
Source: UN (WUP-2018 Revisions)

3.2 Number and Size of Urban Centres: Spatial and Temporal Trends

According to the population census of 2011 there were 506 urban centres in the country. The distribution of these centres by population size class is presented in figure-6. Nearly half (47.43%) of these centres are small each having a population of less than 25,000. These centres serve the surrounding rural areas as service centres. Proper development of these centres are very important from the perspective of rural development. 222 urban cenres are larger than these centres but smaller than the centres having one hundred thousand or more people. These are sub-regional centres and offer higher level functions compared to the smaller centres serving surrounding rural areas. Regional centres are those having one hundred thousand or more but less than five hundred thousand people. Some of these are industrial cities and others offer opportunities for industrial development because of agglomeration and urbanization economies.

One significant feature of urbanization in Bangladesh is that urban population is increasing at different rates in different urban centers. A considerable proportion of urban population lives in district towns and Pourashavas (Municipalities) in Bangladesh. According to population census report of 2011, Dhaka Metropolitan Area had a total population of 14.17 million comprising 33.78% of total urban population. Next in the hierarchy, Chattogram SMA had 3.72 million or 8.88% of the total, followed by Khulna SMA with a total population of 1.041 million or 2.49% of total and Rajshahi SMA with a total population of 0.68 million or 1.62% of the total urban population. Thus, four Metropolitan Areas accounted for 46.78% of the total urban population.

Figure 6: Distribution of Urban Centers by Size Class



Source: BBS (2015): Population Census 2011-Urban Area Report

3.3 Primacy of Dhaka

The urban system of a country may be characterized by the distribution of cities and towns of various sizes throughout the country. Such distribution may be concentrated or dispersed. It is also possible that most of the urban population in a country live in a single city or in a small number of cities. When the largest city is home to a relatively high proportion of the urban population, it is known as the "primate city". The degree of primacy varies depending on the proportion of urban population living in the primate city. The degree of primacy reaches a maximum 100% when all the urban population live in the primate city such Hong Kong or Singapore. Dhaka, the primate city of Bangladesh, accounts for about 12 percent of the total population and 32 percent of the urban population of the country at present (Table-3). The population of the city is about 4 times the population of the second largest city, Chattogram. Dhaka's primacy, by all counts, has been on the rise in Bangladesh, in the last 40 years. In fact, population of Dhaka has multiplied almost 6 times during this 40-year period. About 80 per cent of the garments industry in Bangladesh is located in and around Dhaka. In absolute numbers, Dhaka City is projected to reach 27.4 million by 2030, an increase of 86 percent over the population in 2011.

Table-4 presents the characteristics of the primate city in selected Asian countries including Bangladesh. It is interesting to note that the degree of primacy is highest in Bangladesh compared to the primate cities of other countries both in terms of share of total population and total urban population. Bangladesh also has the lowest number of cities with more than one million people while there are 6 such cities in Vietnam, 14 in Indonesia and 10 in Pakistan. Such concentrated urban development is taking its toll on the livability of Dhaka city. The city is afflicted with innumerable problems resulting from inadequate waste management, poor drainage, air pollution, lack of access to developed land and housing, exposure to excessive noise level, traffic congestion as well as inadequate health and other basic services. As the country aspires to become middle income country by 2030 it is of utmost importance to address these problems and improve the livability index of the city.

Table 3: Primacy of Dhaka City in Different Years

Year	Population (million)	Percent of Urban Population	Percent of Total Population	Dhaka's Population as a Multiple of Second Largest City's Population
1981	03.44	25.42	03.94	2.47
1991	06.84	30.46	06.13	2.91
2001	09.67	34.47	08.20	3.33
2011	14.17	33.78	09.44	3.80
2018	19.57	32.11	11.76	4.06

Source: Population Census Reports (BBS); World Cities Report-2018 (UN)

Table 4: Size of Primate City and Urban Development in Selected Asian Countries

Country	Population (millions) (1)	Urban Population Share of Primate City (% (2)	Share of the Primate City in Population (% (3)	Share of Population in other cities with more than 1 million people (%) (4)	Number of Cities with more than a millio people (5)
Bangladesh	163.0	32.11	11.76	3.5	3
China	1378.7	3.1	1.8	23.4	102
India	1324.2	6.0	2.0	12.9	54
Indonesia	261.1	7.4	4.0	6.6	14
Pakistan	193.2	22.6	8.9	13.2	10

4. Emerging Issues and Their Implications for Graduation to Middle Income Country

4.1 Environment

Urban environmental problems are complex, multidimensional, and interactive. The adverse environmental conditions resulting from inadequate waste management, poor drainage, air pollution, lack of access to safe drinking water and sanitation, exposure to excessive noise levels, as well as inadequate health services, exact a heavy toll on the quality of life. The declining quality of the urban environment results in the poor health and safety of urban residents, particularly the urban poor. It also causes irreparable damage to natural ecosystems in cities and surrounding areas. Dhaka is one of Asia's fastest growing cities, with a population currently around 19 million. With some 400,000 new residents arriving each year from rural areas seeking a better life, Dhaka is straining under the pressure of its rapidly swelling population. The city's environment is already threatened as a consequence of its expanding population. In 2015 these factors were responsible for about 80,000 deaths and about 2.6 million disability adjusted life years or DALYs (number of years lost due to ill-health, disability or early death). In Dhaka corresponding figures were 18,000 and 578,000 (Table-5). The economic costs associated with death and disease or disability estimated at US$1.40 billion in all urban areas of Bangladesh, and at US$310 million in Dhaka alone. This is equivalent to 0.7 percent and 0.2 percent of Bangladesh's 2015 national GDP, respectively. If broader welfare impacts of mortality are taken into account, then the estimated economic impact stands at US$6.52 billion in urban Bangladesh and US$1.44 billion in Dhaka alone, which are equivalent to 3.4 percent and 0.7 percent of the 2015 national GDP, respectively (World Bank, 2018).

The declining quality of the urban environment also causes irreparable damage to natural ecosystems in cities and surrounding areas. Dhaka is one of Asia's fastest growing cities, with a population currently around 19 million. With some 400,000 new residents arriving each year from rural areas seeking a better life, Dhaka is straining under the pressure of its rapidly swelling population. The city's environment is already threatened as a consequence of its expanding population. Air pollution is a major environmental problem in urban areas, especially, the big cities like Dhaka and Chattogram. To address the air pollution issues, it is important to know the possible sources, locations and their strengths, so actions can be taken that can effectively improve air quality.

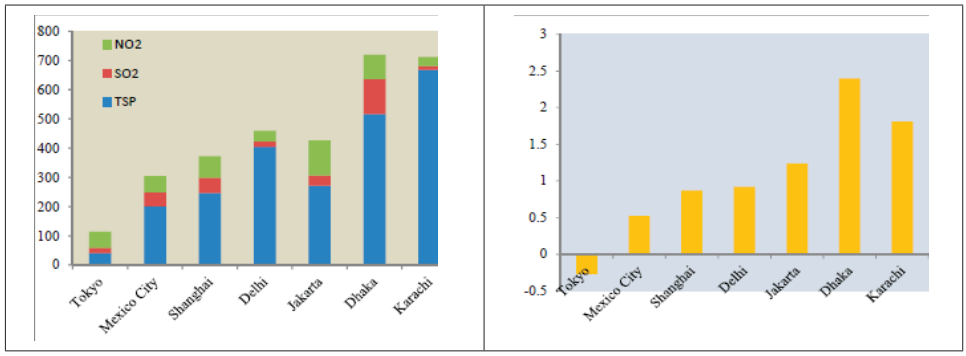
Table 5: Estimated Cost of Mortality in Urban Bangladesh and Greater Dhaka (US$ Billion) and National GDP Equivalences

	Urban Bangladesh				Greater Dhaka			
	Welfare Loss		Forgone Output		Welfare Loss		Forgone Output	
	Amount	GDP equiv.	Amount	GDP equiv.	Amount	GDP equiv.	Amount	GDP equiv.
PM2.5 air pollution								
Ambient	2.42	1.24%	0.49	0.25%	0.53	0.27%	0.11	0.06%
household	1.27	0.65%	0.25	0.13%	0.28	0.14%	0.06	0.03%
Inadequate water, sanitation and hygiene								
Direct impact	0.43	0.22%	0.14	0.07%	0.09	0.05%	0.03	0.02%
Indirect impact	0.08	0.04%	0.04	0.02%	0.02	0.01%	0.01	0.00%
Arsenic in drinking water	0.80	0.41%	0.18	0.09%	0.18	0.09%	0.04	0.02%
Occupational pollutants	1.52	0.78%	0.29	0.15%	0.34	0.17%	0.06	0.03%
Total	**6.52**	**3.35%**	**1.40**	**0.72%**	**1.44**	**0.74%**	**0.31**	**0.16%**

Source: World Bank, (2018): Enhancing Opportunities for Clean and Resilient Growth in Urban Bangladesh: country environmental analysis 2018

Urban air pollution in Bangladesh is on the rise due to upward trends in the number of vehicles on roads. Other sources include manufacturing and food processing, brick-fields, construction works, coal-fired power stations, metal refining etc. Four pollutants – suspended particulate matter (SPM), nitrogen dioxide (NO2), sulfur dioxide (SO2), and air-borne lead are mainly responsible for worsening of the situation. Figure-7 presents a comparative assessment of air quality in selected megacities of Asia. Dhaka has the highest air pollution in the context of ambient air quality and multi-pollutant index compared to other mega cities. Air pollution is thus a major environmental problem for the city. To address the air pollution issues, it is important to know the possible sources, locations and their strengths, so actions can be taken that can effectively improve air quality.

Figure 7: Comparative Assessment of Air Quality in Selected Megacities including Dhaka



Source: Swapan et al, Urban Science, October, 2017

Ambient air quality measurements (µg m-3) (TSP = total suspended particles).

Multi-pollutant index (MPI) (MPI denotes the combined level of the three criteria pollutants (i.e.,

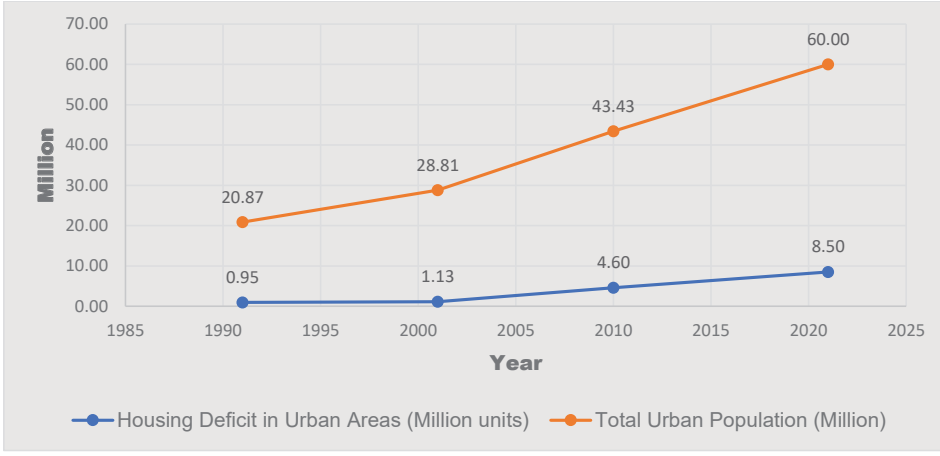
4.2 Land and housing

During the last few decades the price of land in urban areas of the country sky-rocketed and in Dhaka city the increase was as much as 80 times. The level of price rise, however, varies with the area and depends on a number of local factors including the level of services available. In recent years land price in Dhanmondi area surpassed all previous records and developers are competing with each other for a single piece of land. Ever increasing land price has also contributed to the deterioration of housing situation as the land prices have driven the poor households out of the formal land markets and forced them into the informal land markets which are characterized by slums and squatter settlements. The urban land market which directly affects the urban environment and quality of urban life suffers from many distortions due to lack of proper land development and management policies including lack of planning and slow provision of infrastructure and services, thus leading to unplanned or ribbon development of land in the urban periphery.

Rapid growth of urban population and consequent demand for land and housing have made the situation even worse, particularly in big cities. Very few households have access to land and credit facilities. The situation is particularly worse for the lower income group and the poor who live on marginal settlements built by small land developers or by the occupants themselves without any security of tenure. Due to lack of tenure, the poor cannot meet the need for guarantees of loan repayment. This puts most conventional sources of credit for housing construction out of the rich of the poor resulting in lower level of housing investment. This led to overcrowding, lower quality of housing units and the proliferation of slums and squatter settlements.

Housing deficit in urban areas was estimated to be about 0.91 million units in 1991 which increased to about 4.6 million units in 2010 (National Housing Policy, 2017). Based on various studies, the National Housing Policy, 2017 indicated that by 2021 the deficit would be around 8.5 million housing units (Figure-8). This dismal housing scenario has also been a major factor contributing to extreme homelessness in urban areas.

Figure 8: Urban Housing Deficit



Source: National Housing Policy, 2017

Apart from the existing huge shortage in housing stock, the majority of the dwelling units is structurally very poor, lack services and utilities, and built without proper planning. According to Household Income and Expenditure Survey, 2016 (BBS, 2017), only 25.73 percent of the houses in urban areas in 2016 were pucca (made of brick/cement) compared to 31.04 percent semi-pucca and 41.77 percent kutcha (Table-6). However, proportion of pucca and semi-pucca structures increased from 2001 while there was a decline in the proportion of kutcha structures and jhupries indicating improvement in the economic condition of the people.

Table 6: Percent of Households by Structure Type

Type of Structure	2001	2010	2016
Jhuprie (Thatched house)	7.58	1.85	1.46
Kutcha (No cement/concrete used)	47.15	41.56	41.77
Semi pucca (Only wall made of cement/concrete)	23.26	27.88	31.04
Pucca (Roof and wall made of cement/concrete)	22.01	28.71	25.73
Total	100.00	100.00	100.00

Source: HIES 2010 and HIES 2016

4.3 Basic urban services

4.4 Water Supply

Bangladesh has made remarkable achievement in the supply of improved water to both urban and rural population during the last few decades. In 1990 nearly 81% of the urban population had access to improved water. By 2015 about 99% of the urban population were covered by improved water supply and 38% of them had access to piped water (Table-7). Majority of the people (about 60%) in urban areas, however, use tube well as their main source of drinking water (BBS, 2017).

Table 7: Water Supply Coverage According to JMP Reports, 2014 and 2017

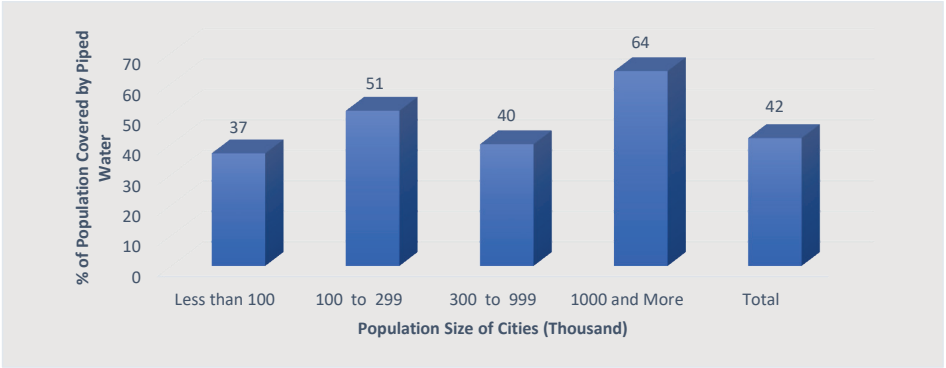
URBAN WATER (Estimated Coverage)					
Year	Total Improved (%)	Piped onto Premises (%)	Other Improved (%)	Other Unimproved (%)	Surface Water (%)
1990	81	23	58	17	2
1995	82	25	57	16	2
2000	83	27	56	16	1
2005	84	29	55	15	1
2010	85	31	54	15	0
2012	86	32	54	14	0
2015	99	38	61	01	0

Source: JMP (Joint Monitoring Program), 2014 and 2017, WHO & UNICEF, Progress of Drinking Water & Sanitation

The overall urban situation with respect to water supply does not necessarily mean that all the urban residents have equal access to improved water. Figure-9 presents data on coverage of population by piped water suppl in 7 city corporations and 31 paurashavas grouped according to population sizes. In cities with one million or more people 64% of the population get piped water on an average while in pourashavas with less than 100 thousand people coverage of population by piped water is only 37% on an average. Thus, the supply

of piped water at the Pourashava level is quite unsatisfactory. Water supply situation is extremely unsatisfactory in slums and squatter settlements. Despite the fact that the poor are supposed to benefit most from government services, this is not always the case. The quantity of water the poor get is quite insufficient and far below the GOB basic service level for water supply of 20 litres per capita per day.

Figure 9: Average Coverage by Piped Water (% of Population)



Source: World Bank (Water Supply and Sanitation Program) 2014: Benchmarking to Improve Urban Water Supply Delivery in Bangladesh and Author's Calculation

4.5 Sanitation and Solid Waste Disposal

The use of sanitary toilet facilities in urban areas increased quite significantly during the last three decades. From table-8, it is observed that there has been an increasing trend in the use of sanitary toilet facilities since 1981. In 1981, 32.4% of urban households used sanitary toilets which increased to 82.12% in 2016. At the same time, the percentage of households that does not have any toilet facility decreases from 13.2% in 1981 to 0.94% in 2016.

Table 8: Percent of Urban Households with Sanitary Facilities

Year	Toilet Facilities		
	Sanitary	Other	None
1981	32.4	54.5	13.2
1991	56.2	30.4	13.3
2001	67.3	25.34	7.36
2005	79.8	18.5	1.00
2010	76.12	23.11	0.77
2016	82.12	16.94	0.94

Source: BBS, 2005a; HIES (BBS), 2010 and 2016

The impact of urbanization is felt more intensely in the area of waste generation in cities and towns of the country. Generation of solid waste in urban areas of Bangladesh has been increasing commensurate with increase in urban population. Table-9 below shows the growth in solid waste generation in Bangladesh since 1991. It is quite clear that generation of solid waste in urban areas of Bangladesh has been increasing commensurate with increase in urban population despite the fact that the amount of solid waste generated per capita per day is lower compared to developed countries.

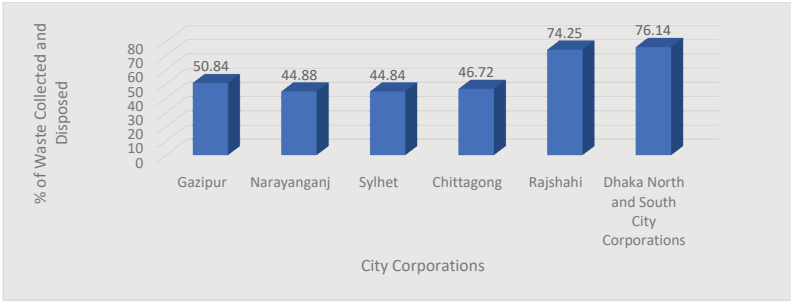
Table 9: Growth in Solid Waste Generation in Bangladesh Since 1991

Year	Total Urban Population	Urban Population (in percent)	Waste Generation (kg/cap/day)	Total Waste Generation (tonne/ day)
1991	20872204	20.15	0.49	9873.5
2001	28808477	23.39	0.50	11695
2005	32765516	25.08	0.56	16382
2014	41940000	29.00	0.56	236 88
2025 (projected)	78440000	40.00	0.60	47064

Source: Waste Concern: Bangladesh Waste Database 2014

Collection and disposal of huge quantities of solid waste generated daily in large urban areas is indeed a daunting task for the urban local governments. It requires organizing the staff for collection, arranging transportation and funding ways of disposing the waste collected. Collection and disposal of garbage in most of the urban centres, however, are not managed efficiently. Waste collection efficiency defined as the proportion of generated waste collected and transported to disposal site, also varies widely across cities. In Dhaka, for example, the quantity of solid waste generated at present is around 6000 tons per day. Nearly 24% of the solid wastes generated daily remain uncollected. A part of this waste either remains in the streets or on nearly open ground. Some of the waste flows to the open drains and blocks the normal drainage flow. As a result, water logging sometimes disrupts the normal city life for days during monsoon. The serious health hazard posed by this situation is of major concern. Figure-10 shows that collection efficiency is 76% for Dhaka city (North and South) indicating that 24% of the wastes generated remain uncollected and not disposed. In Gazipur, Narayanganj, Sylhet and Chattogram 45% to 50% of the generated wastes are collected and disposed. The situation is, however, better in Rajshahi where about 74% of the generated wastes are collected.

Figure 10: Waste Collection Efficiency of City Corporations



Source: DoE (Department of Environment), 2013, Final Report on Baseline Survey on Waste Generation, Character Analysis and Traffic Volume Survey in Bangladesh; BIGD, 2015: State of Cities: Solid Waste Management in Dhaka City- Towards Decentralised Governance

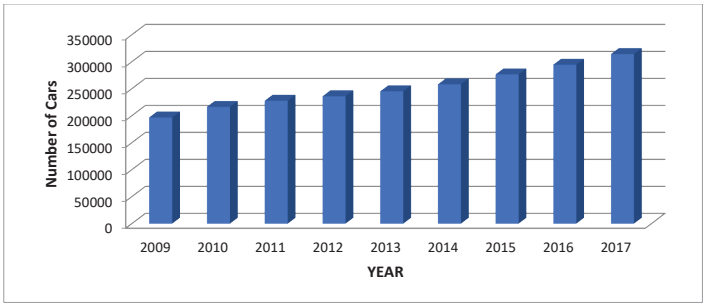
4.6 Transportation

Road transport system in urban areas is the main means for movement of passengers and commodities. Rail and water transport systems are mainly used by commuters and for transporting commodities between urban areas. Rapid urbanization in Bangladesh during the last few decades led to manifold increases in the number of motorized and non-motorized

vehicles on city streets. Continuous and rapid increase in the number of private passenger cars is considered primarily responsible for congestion on urban roads (Figure-11). Cars cause problems not only when they are moving, they also require an inordinate amount of space for parking. Private car ownership in Dhaka has increased steadily from 5.85 vehicles per 10,000 persons in 1971 to 34.6 in 1992, an increase of about 490 percent. By 2011 car ownership reached 160 per 10,000 persons indicating continuous increase in the number of cars on the roads. Although private cars account for a small proportion of total number of trips in the city, they occupy much larger road space. Car is the most inefficient transport mode in terms of number of passengers and occupation of road space.

Road transportation dominates the transport systems in the country which provides passenger services and transportation of commodities. In urban areas also road transport system is the main means for carrying passengers and commodities. Rail and water transport systems are mainly used by commuters and for transporting commodities between urban areas.

Figure 11: Growth of Private Cars in Dhaka City between 2009 and 2017

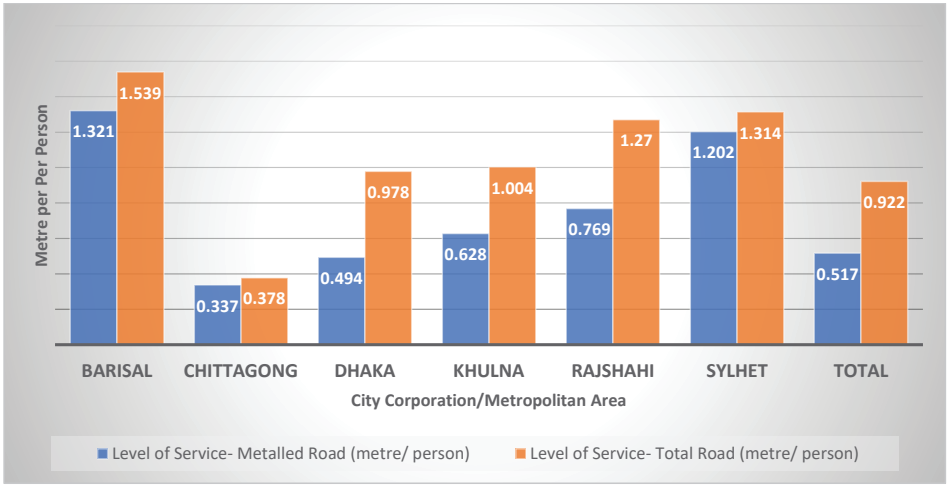


Source: BBS (2018): Statistical Year Book

Figure-12 represents the level of service of roads in six city corporations. Level of service (LOS) is defined as meter per person which is in most satisfactory condition in Barishal but in worst situation in Chattogram. If all types of roads are considered best level of service is found in Barisal followed by Sylhet, Rajshahi, Khulna, Dhaka and Chattogram. Chattogram performs worst both in terms of paved roads and all types of roads probably due to physical characteristics of the city. Among the six city corporations, Dhaka is confronted with the most serious transportation problems. The transport sector of the city is comprised of many different modes of travel-both motorized and non-motorized-often using the same road space – resulting in a high level of operational disorder, that significantly diminishes the efficiency and effectiveness of the existing transport uses.

The capital city Dhaka receives most attention from the policy makers in terms of addressing its transportation problems while major secondary cities like Chattogram, Khulna, Rajshahi, Sylhet, Comilla, Bogra and Mymensing do not receive proper attention despite the fact that these cities also face significant transportation problems. In recent years CNG driven and battery operated auto-rickshaws have flooded the city streets in these urban areas causing severe traffic congestion. Non-motorised transport modes such as walking, rickshaws and bicycles are also used by a significant percentage of people in these cities.

Figure 12: Level of Service of Roads in Six City Corporations and Dhaka Metro Area



Source: City Corporations and RAJUK, 2019

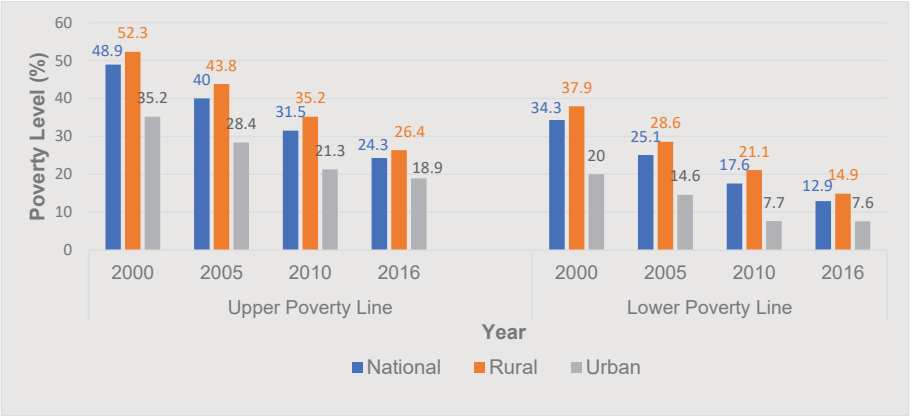
Non-existence of transport planning and inefficient traffic engineering result in low quality traffic management. Public transport systems are poorly organized and there is lack of integration with non-motorized vehicles. Buses are in short supply and there is inadequate rail system to handle day-to-day commuter traffic. Moreover, the growing dependence on private vehicles for intra-metropolitan trips is currently a crucial component in the debate on sustainable urban development, given the economic, social and environmental impact for which it is responsible. Considering all these factors, it has become a challenging task for the government as well as transport planners and engineers to cater the demand of mobility for the ever-increasing urban people in a more sustainable way.

4.7 Urban Poverty

Poverty is understood to encompass many different aspects including inadequate consumption, inadequate income and asset base, and inadequate access to basic infrastructure and services. But in most nations including Bangladesh, poverty is measured in terms of the population falling below an income-based or consumption-based poverty line. For estimating the poverty lines, the Cost of Basic Needs (CBN) method is now widely used. In this method, two poverty lines are estimated: lower poverty line and the upper poverty line. The lower poverty line corresponds to the extremely poor households whose total expenditures are equal to the food poverty line while the upper poverty line corresponds to the moderately poor households whose food expenditure is at the level of food poverty line. Using the upper poverty line, BBS [3] estimated the Head Count Rate (HCR) of incidence of poverty as 24.3% at national level, 26.4% in rural areas and 18.9% in urban areas (Figure-13) in 2016. There was a reduction of HCR by 7.2% point at national level, 8.8% point in rural areas and 2.4% in urban areas during the period from 2010 to 2016.

3 Household Income and Expenditure Survey (HIES) - 2016

Figure 13: Poverty Level (%) by Upper and Lower Poverty Lines in Different Years



Source: BBS (HIES 2005 and 2010 and 2016)

Household income is found to be much higher in urban areas than in rural areas. Report of the household income and expenditure survey, 2016 (BBS, 2017) indicated that monthly income per household in urban areas was about 70% higher than the household income in rural areas. Consequently incidence of poverty is also higher in rural areas than in urban areas. Using the upper poverty line, BBS [4] estimated the Head Count Rate (HCR) of incidence of poverty as 48.9% at national level, 52.3% in rural areas and 35.2% in urban areas (Figure-13) in 2000. In 2016 incidence of poverty was 24.3% at national level, 26.4% in rural areas and 18.9% in urban areas indicating that the incidence of poverty in urban areas was about 40% lower than in rural areas and nearly 29% lower compared to the national level. Level of extreme poverty estimated on the basis of lower poverty line is also found to be much higher in rural areas. In 2016 proportion of people living below lower poverty line (extreme poor) was about 50% higher in rural areas than in urban areas.

One of the major causes of rapid urbanization in Bangladesh during the last few decades is the migration of rural people to urban areas. A significant percentage of these people have been forced to leave their homes in rural areas due to poverty. Thus poverty has increasingly been urbanized by way of transfer of the rural poor to urban areas, especially the large cities. But manifestation of urban poverty is often more appalling than that of rural poverty and this is invariably associated with poor quality housing.

Rapid increase in urban population has contributed to the skyrocketing of land prices in urban areas. This has made it extremely difficult for the urban poor to get access to serviced land. Most of the urban poor live in slums and squatter settlements characterized by substandard living conditions. Slums and squatter settlements are found in all major cities in Bangladesh although their concentrations may vary depending on the size of cities. The largest concentrations are found in Dhaka followed by Chattogram, Khulna and Rajshahi. Secondary cities or district towns also have significant concentrations of slums and squatter settlements. CUS in its survey of 2005 found 4300 slums and squatter settlements and about 2.8 million slum dwellers in Dhaka City Corporation area. The same survey found 1814 slums in Chattogram City Corporation with about 1.8 million slum dwellers followed by Khulna City Corporation having 470 slums with 0.17 million slum dwellers and Rajshahi City Corporation having 539 slums with0.148 million slum dwellers.

4 Household Income and Expenditure Survey (HIES) - 2016

Majority of those living in slums are very poor and nearly 80 percent of the households have income below the upper poverty line. More than 50 percent of the slum dwellers earn less than half of the poverty line income while about 25 percent of them are in extreme poverty and destitution (CUS Bulletin 48, 2005). More than 90 percent of the income earners are engaged in informal sector activities. They work mainly as rickshaw-pullers, transport workers, hawkers, day laborers, small factory workers, construction workers, etc. Many of the female members of slum households in Dhaka and Chattogram are employed in the formal sector garment factories and in very large numbers in domestic work as maids. What is interesting, however, is that few among the male slum dwellers remain unemployed because of their easy access to informal sector activities. This is perhaps the most important factor stimulating rural to urban migration.

Economic growth, however, is unsatisfactory if it is accompanied by continuing or increased inequity and poverty. Urban poverty is characterized not only by low income but also by poor living conditions and lack of access to opportunities and services. One major problem of macro-economic policies is that measures designed to encourage investment and achieve economic growth does not necessarily result in economic opportunities accessible to the poor and may exacerbate poverty, even while expanding the overall economy. The urban poor are especially vulnerable to economic shocks. They lack the access to services, safety nets, civil protections, and political representation enjoyed by upper-income groups. Urban living conditions, especially in large and fast-growing cities, are deteriorating relative to those in smaller towns. These changes are raising questions regarding conventional views of urban advantage and creating a potential for increasing social problems.

It is important to keep in mind that large sections of the urban population which official statistics classify as not being among the 'poor' still face serious deprivations because of very inadequate asset bases and inadequate access to basic services. Thus, an assessment of urban poverty in terms of income or calorie intake may become misleading as it does not give any idea about the extent to which the urban poor have access to urban infrastructure and basic services like shelter, water supply, sanitation, drainage, waste management, health, etc.

4.8 Climate change and disaster management

Flooding and water-logging have become a major problem of urban areas, especially the big cities. The problem becomes quite serious during annual monsoon with widespread and lengthy disruption of roads, telecommunications, electricity supply and water supply. Recurrent floods and water logging are the major natural events that create havoc and disrupt socio-economic life of the cities. With the changing climate the intensity of rainfall has also increased in recent years and extreme events such as floods, drainage congestions, and water logging have become a regular occurrence in the rainy season. The situation is likely to deteriorate further with increased urbanization accompanied by intense industrial and commercial activities, increases in built-up areas and consequent loss of green areas and wetlands.

Dhaka has been declared as the most vulnerable megacity to climate change by the World Wide Fund for Nature (WWF) in 2009. Hazard potential of the city will significantly increase in future due to climate change. The intensity and pace of present and future climate changes induced by continuous emission of greenhouse gas will be a major challenge for the city as the frequency and intensity of flooding are likely to increase.

This will threaten the critical infrastructure that supplies the city dwellers with essential services such as electricity, water, waste disposal, transportation, telecommunication etc. In September 2004 continuous rainfall for about 48 hours inundated most parts of Dhaka city. A record 315 millimeters of rainfall in the city on 12th and 13th September disrupted business and economic activities and forced the suspension of Dhaka's Stock Exchange. A report by Dhaka's Water and Sewerage Authority (DWASA) indicated that the heavy downpour affected 250 schools and 681 garment factories in addition to shopping malls, business houses and various other factories.

Hazard potential of urban areas will significantly increase due to climate change. Adaptation will require policies and investments to make urban areas resilient to the effects of climate change including loss of property, habitat, and infrastructure. Formulation of effective adaptation measures, however, would require a better understanding of the factors responsible for flooding and water-logging in urban areas, urban drainage systems and their performances, and the issues and challenges that should be addressed to develop sustainable urban drainage systems in the country.

There are two types of city inundation namely urban floods and river floods. Urban floods are classified as the city inundation caused by drainage congestion and water logging. And river floods are classified as the city inundation caused by river floods. Urban flooding in the built areas of Dhaka city is a major concern and a matter of serious discussion among the city dwellers. It causes unbearable sufferings for the people by creating difficult situation for traffic movement as well as unhygienic environment that has long lasting consequences. Following are the main reasons for urban flooding in different cities including Dhaka:

- Increase in covered areas causing higher rainfall run-off volume
- Unplanned and uncoordinated development of the city
- Continuous filling of wetlands for expansion of the city both by the public sector and private organizations
- Unauthorized and illegal occupation and destruction of natural drainage system and retention basins
- Inadequate storm water drainage facilities
- Clogging of drainage channels and sewer lines due to indiscriminate dumping of solid wastes and inadequate cleaning of sewers, catch pits, etc.; and
- High water level in the peripheral river system.

The disappearance of the natural drainage system is one of the main causes for water logging. Rapid population growth and unplanned development, unplanned land filling to develop new residential areas, uncontrolled and haphazard disposal of solid wastes and garbage into the existing drainage system, and encroachment on lakes, khals/canals and rivers with unauthorized construction are the main activities that can be linked to the disappearance of natural drainage system.

Planning, construction and maintenance of drainage system in a city may be shared by a number of agencies. In Dhaka, for example, Development and maintenance of drainage system are shared by DWASA, DNCC, DSCC, BWDB, RAJUK and Cantonment Board. Lack of capacity and poor coordination among these agencies are often cited as one of

the major reasons for poor performance of Dhaka's drainage system. Dhaka's two DCCs are responsible for development and maintenance of the surface drains and roadside inlets. DWASA, on the other hand, is responsible for development and maintenance of the underground storm-water drainage system. As the performances of surface drains and storm-water drains are dependent on each other, strong coordination among these authorities is essential.

In Chattogram also governance of drainage systems does not belong to any particular authority. Several authoritative bodies are responsible for managing the drainage system of the city. The core responsibility for storm water drainage and sewerage belongs to CWASA. However, CWASA has neither developed any sewerage system nor storm water drainage infrastructure till date. CCC is mainly working on the local and tertiary drainage development and construction and is also responsible to keep the drains clean. CDA's role is to incorporate drains in land-use and structural plans and allot space in city designs. The Bangladesh Water Development Board (BWDB), another statutory body, is responsible to plan the flood management of CCC and they are both involved in linking embankment with the drainage system. Lack of capacity and coordination among these authorities are also cited as one of the major reasons for poor performance of the drainage system in Chattogram.

Apart from institutional coordination, there is also lack of involvement of civil society – local community, NGOs, private sector and academia in the planning, development and management of the drainage systems. The institutional arrangements are week and the management organization lacks incentives for giving better outputs. The organizations function more like bureaucratic organizations rather than customer driven organizations and lack a holistic view of their management.

5. Planning, Development and Management of Urban Areas: Major Issues and Challenges

5.1 Present System of Urban Governance and management

At present urban development activities in Bangladesh are carried out mostly by central government organizations. There are at least eighteen main ministries and 42 organizations which are involved in the development of urban areas. National level agencies provide services to different urban areas including city corporations, paurashavas and other urban centres as part of their national responsibilities. Some of the important national agencies are Urban Development Directorate (UDD), National Housing Authority (NHA) and the Public Works Department (PWD) under the Ministry of Works, the Department of public Health Engineering (DPHE) and the Local Government Engineering Department under the Ministry of Local Government, Rural Development and Cooperatives, the Roads and Highways Department under the ministry of Communication, the Directorate of Environment under the Ministry of Environment and Forest and the power Development Board under the Ministry of Energy and Mineral Resources. Other Ministries such as the Ministries of Commerce, Education, Finance, Agriculture, Youth and Sports, and Water Resources Development are also actively involved in the process of urban development mainly through their regional and local level agencies (Mohit, 1992).

At the local level, City Corporations and Pourashavas function as urban local governments. All divisional headquarters and some larger cities such as Gazipur, Narayanganj and Cumilla

have city Corporations. At present there are 12 city Corpoarations and 335 Pourashavas. Separate planning and development organizations have alsp been created for the cities of Dhaka, Chattogram, Khulna, Rajshahi and Cox's Bazar. The development authorities in these cities are authorized to undertake local urban planning as well as infrastructure and site development activities for housing, commercial and industrial use. The authorities are also empowered to exert development control functions.

Table 10: Hierarchy of Urban Local Governments

Mega City	**For example: Dhaka Metropolitan Area**
City Corporations at Divisional Headquarters and larger cities	Dhaka North, Dhaka South, Chattogram, Khulna, Rajshahi, Sylhet, Barisal, Rangpur, Mymensingh, Narayanganj, Gazipur and Cumilla
Paurashavas (Municipalities)	Number of Paurashavas - 335 at present
Category determined on income level	Annual income level
Class A Paurashavas	At least Tk. 8 Million
Class B Paurashavas	Between Tk. 4 Million and 8 Million
Class C Paurashavas	Between Taka 2 Million and Tk. 4 Million

Source: BBS and LGED

At some divisional Headquarters special purpose agencies have also been created that provide special services to the city dwellers such as the Water Supply and Sewerage Authority, Electricity Supply Authority, etc. The Water and Sewerage Authority (WASA) Act, 1996 empowers the government to establish WASAs and permits WASAs to carry out works related to water supply, sewerage and drainage systems. There are four water and sewerage authorities in Dhaka, Chattogram, Khulna and Rajshahi. Dhaka Electricity Supply Authority is mainly responsible for distribution of power while the gas distribution authority is responsible for distribution of gas to the residential, commercial and industrial areas. The functions of all these organizations are important in urban development

5.2 Regulatory framework for Urban Governance and Management

Initiatives to steer urban development activities in a planned manner can be traced back to the enactment of the building construction act 1952 and the Town Improvement Act 1953. These acts were mainly enacted to deal with the situation arising out of huge influx of refugees after the partition of India in 1947 and increased rural-urban migration due to enhanced administrative and economic activities in Dhaka city after it became the capital city of the then East Pakistan. The Building Construction Act 1952 provides for the prevention of haphazard construction of buildings and excavation of tanks which are likely to interfere with development in certain areas. The Town Improvement Act 1953 provides for development, improvement and expansion of the towns of Dhaka and Narayanganj and certain areas in their vicinity and the formation of a board of trustees. The Building Construction Rules framed in 1953 were made to facilitate exercise of powers conferred by the Building Construction Act 1952.

The need for regulation and control of urban development gained further impetus after the independence of Bangladesh as the plans and regulations existing at that time were found to be inadequate to deal with population growth and land use changes. Despite rapid urbanization in the country there was no initiative to plan or control urban development activities during 1970's and 1980's. It was only after 1990 that some steps were taken for control of development in big cities. These included preparation of development plans for

Dhaka, Chattogram, Khulna and Rajshahi cities, and formulation of Building Construction Rules-1996, Private Residential Area Development Rules-2004 (revised in 2008) and Dhaka Metropolitan Building Construction Rules (2008). The Bangladesh National Building Code (BNBC) which was prepared in 1993 came into force in 2006 after some modification. BNBC has been revised again recently (2017) and awaiting approval of the Government.

Other legislations which are relevant for the urban sector include Bangladesh Environment Protection Act 1995 (modified in 2000) and the Act (36 of 2000) for Conservation of Play field, Open space, Park and Natural Water Reservoir in Mega City, Divisional Town, District Town and Paurashavas of Bangladesh. The Local Government (Paurashava) Act and the Local Government (City Corporation) Act were enacted in 2009 which gave the Paurashvas and City Corporations wide responsibilities in town planning and development, public health and sanitation, water supply and sewage disposal, maintenance of public infrastructure and amenities. Important policy-related documents relevant for the urban sector include the National Housing Policy-1993 (revised in 2016), National Environment Policy 1992 and the National Land Use Policy 2001.

5.3 Planning Framework for Urban Development

Urban Development Authorities in Bangladesh used to follow traditional master planning approach until 1996. Such traditional approach to planning was found to be inappropriate for meeting the needs of our cities which were characterized by rapid growth of population. Traditional master planning has often been ineffective because too much emphasis is put on plan making and too little on implementation. In addition, such master planning has paid little or no attention to the necessary resource allocation needs and financial feasibility of policies and programmes. Very few traditional master plans addressed the financial implications of the programmes and projects they recommended either the actual costs involved or how they would be financed. Such plans fail to reflect the priorities, resource constraints and programmes of the agencies responsible for infrastructure provision.

Traditional master plan has often been considered as an end in itself rather than just one component in the management of urban processes. Planners have often used a two-dimensional approach to land development, viewing it as a matter of zoning, networks and forecasts. Heavy reliance on technocratic process and too little attention paid to socio-economic and political processes often leads to the formulation of policies and programmes which are ignored of rejected by politicians and the community.

In order to address the shortcomings of traditional master planning and meet the needs of sustainable development, more flexible urban planning approach is now followed which have the following advantages:

- Timely collection of relevant data. suitable for making recommendations of the development plan.
- More efficient planning process: Streamlined and therefore more efficient procedures at various levels of the planning activity, will reduce the amount of time to carry out the process and produce a greater number of completed plans.
- Greater flexibility: Such planning processes give more flexibility to professionals and officials in responding to constantly changing conditions in urban areas.

Since plans will specify option for development rather than single solution, local authorities will not be locked into uncompromising positions.

- Better integration: Such planning processes facilitate more integrated approaches to urban development. This integration can be technical (co-ordination of urban planning with ecological management, energy, transport and other key sectors), equitable (explicit impact on all income groups in both the household and commercial sectors), and institutional (both vertical and horizontal coordination of urban planning, sectoral investment, financial resources, cost recovery and administrative functions).
- Regular updating of plans: Once planning capacity has been established in a local authority, it will be possible to update the plans regularly to reflect urban growth and changing needs and priorities.

The current approaches to urban planning can be grouped under structure planning, local planning and action planning and are outlined below:

5.4 Structure Planning

The structure plan sets out strategies for guiding the social, economic and physical development of the urban area under consideration. The plan consists of written statements accompanied by illustrations and diagrams and provides the basis for the preparation of detailed local plans or multi-sectoral investment plans. Structure planning is increasingly seen as a participatory approach to integrated urban development. The output of the process is not just a physical development plan for the city but a set of inter-related strategies for city development including land, infrastructure, finance and institutions. These strategies aim at enabling all public and private initiatives to promote economic growth, provide basic urban services and enhance the quality of the environment. At the city wide scale the process involves multi-sectoral coordination of spatial planning, sectoral investment plans, financial resources and constitutional frameworks to meet inter-sectoral city development objectives over a long time period of say 15 to 20 years.

5.5 Local Planning

Detailed plan for specific sections of urban area as identified in the structure plan can be prepared for rapid development or for special projects and improvements. Such plan should contain detailed information on the preferred development pattern, location and layouts of proposed roads, infrastructure, community facilities and land use zones. The width and location of streets and pedestrian ways as well as size and location of built areas, public facilities, industrial estates, commercial areas should also be indicated. The proposals of the local plans should conform to the development goals and objectives of the structure plan while at the same time meeting local needs.

5.6 Action Planning

Action planning is generally defined as an implementation-oriented process to solve problems at a local level. It has a short-term perspective, resolving issues in the most direct manner with a minimum of data collection. The problems to be remedied may be physical, social or economic and local community participation in decision making is a key to success. The action plan examines, in the context of the structure plan or local

plan, those items that might be implemented within five years and contains more detail on a more limited range of subjects than the structure plan or the local plan. It is prepared in consultation with local agencies and communities and consists of two parts, project selection and project evaluation. Project selection summarizes existing guidelines and lists the criteria used in selection before identifying priorities in each sector and proposing projects to address those priorities. Project evaluation (both qualitative and quantitative) looks at project which might be locally funded over the five-year period, given budgetary and other constraints, and looks at projects which cannot be locally funded but which might be considered by national agencies operating locally and makes preliminary assessments of larger scale projects which would need larger investments.

5.7 Challenges of Urban Management

It is obvious that urban development activities in Bangladesh are dominated by national sectoral agencies. In the absence of proper institutional and legal framework to guide and control physical development in urban areas, urban development in most cases has been haphazard. The involvement of multiple organizations in the urban development process results in uncoordinated and overlapping activities. Major urban functions are divided among various ministries but their activities are not coordinated at the local level. While Planning Commission is responsible for allocating government expenditure, it does not coordinate below the national level. It does not even take into account the approved city master plan in the process of approval of the projects submitted by different utility and/or infrastructure providing parastatals. Consequently, unplanned investments at local levels retard desired growth and invite further problems to encounter.

Lack of any initiative on the part of successive governments to address the institutional weaknesses has led to marked deterioration in many areas of urban management, especially in larger cities. Until recently, a total lack of co-ordination was evident in many ways (Siddiqui, et.al, 2004). The most common example of lack of co-ordination is, of course, the constant digging and filling of the city roads by various agencies at different times of the year, causing immediate suffering to the people. Evidence of serious management problems of the city can also be found in frequent break downs in essential services such as supply of water, gas, disposal of waste and control of traffic. In the face of ever-growing demands of the people, the municipal governments and the single purpose government organizations have failed to deliver the services and facilities to its residents in a satisfactory manner. The efforts of NGOs, CBOs and private sector organizations are also highly limited and fragmented.

The challenge of urban management will obviously differ with the size and complexity of each city. While bigger cities suffer from functional fragmentation and uncoodinated management, smaller municipal bodies typically suffer from extremely poor capacities and lack of technical support. Unless concrete steps are taken by the government to enhance the weak administrative and institutional capacities of municipalities and city corporations, it is unlikely that significant improvement in the quality of life in urban areas can be achieved.

5.8 Urban finance

The city corporations and pourashavas are responsible for provision and maintenance of urban infrastructure and services but they lack the capacity and resources to carry out their responsibilities properly. Despite rapid population growth and the consequent need

for infrastructure, urban local authorities have very little investment capacity. Resource base of urban local bodies is extremely weak although these are the most appropriate authorities to finance infrastructure investments. In fact, the benefits of most urban infrastructure are obtained at local level. In terms of efficiency, local government bodies are most suitable to set local priorities and develop local infrastructure facilities, but this is not possible, given the current state of local government revenues. Consequently, they have to depend on central government grants to pay for their infrastructure development. Over the years, however, grants to local governments are declining. Government grants to City Corporations and Pourashavas through Annual Development Program (ADP) fell from 0.82 and 0.86 percent of ADP respectively in 1997/98 to 0.63 and 0.74 percent in 2001/2002. The situation remained the same or even worsened in some years during the last 15 years. During FY2015-16 and 2016-17 Government's allocation for urban local governments was only 0.76% and 0.52% of the national budget respectively (Table-11).

Shortage of fund is a major constraint for proper functioning of the urban local bodies. The sources of their income are generally taxes, rates, fees and charges levied by the local body as well as rents and profits accruing from properties of the local body and sums received through its services (Table-12). Holding tax is the most important source of own income of local bodies. Loans and voluntary contributions are insignificant. Non-tax revenues are of two kinds: fees and tolls and rents and profits on properties of the local bodies. Urban local bodies have to depend on the government for a significant proportion of their expenditure since they raise between 55-75 per cent of the revenue from their own source. Nowadays, foreign or international project funds also contribute a significant share of a corporation's budget. The Bangladesh Municipal Development Fund (BMDF) was created to finance the city and Pourashava capital investment demands through using governments fund and international agencies and also through accessing capital markets.

Table 11: Government's Allocation for Local Government Institutions (Crore Taka*)

FINANCIAL YEAR	2013-14 (Actual)	20114-15 (Actual)	2015-16 (Revised)	2016-17 (Provisional)
City Corporation	1087.28	874.67	1617.00	1347.29
Pourashava	386.01	502.58	405.89	421.79
Urban Local Government Institutions (ULGI) Total	1473.29	1377.25	2022.89	1769.08
Zila Parishad	334.05	600.53	380.90	391.00
Upazila Parishad	337.77	622.81	473.09	549.93
Union Parishad	195.87	197.35	208.70	204.00
Local Government Institutions (LGI) Total	2340.98	2797.94	3085.58	2914.01
Budget for Local Government Division (LGD)	13326.43	17005.24	19221.16	21326.28
ULGI Allocation as % of LGD Budget	11.05	8.10	10.52	8.29
ULGI Allocation as % of National Budget	0.78	0.67	0.76	0.52
LGI Allocation as % of LGD Budget	17.57	16.45	16.05	13.66
LGI Allocation as % of National Budget	1.24	1.37	1.17	0.86

Source: Kabir, M. (2017): Local Government and Economic Empowerment in the Daily Star, 27 February,2017
*Crore=10 million

Table 12: Sources of Municipal Revenue

Source Sub-components	Source Sub-components
Property tax	Property tax on annual value of buildings and lands
	Conservancy rate, Water rate (except Dhaka and Chattogram), Lighting rate
Shared property tax	Surcharge on the transfer of property ownership
Other taxes	Tax on professions, trade and callings
	Tax on vehicles and animals
	Tax on cinema, dramatic and entertainment
	Tolls and minor taxes (on advertisement, marriage etc.)
Non-tax source	Fees and fines
	Rents and profits from property
	Other sources
Loans	internal, from banks, etc.
	International agencies
National Funds and Projects	Bangladesh Municipal Development Fund (BMDF), and Municipal Services Project (MSP)
Government grants	Salary compensation grants
	Normal development grants
	Extra ordinary grants

The local governments in Bangladesh lack organizational capabilities to undertake and successfully complete the massive task of urban development. One of the reasons for such a deficiency is the lack of trained manpower resources available to the local authorities. Many of the municipalities remain under-staffed. In practice, urban development should be technically sound and more balanced to respond to the demands and requirements of all citizens. Much greater investment should be made for building a cadre of trained professionals within the system of urban governance and management who are specially equipped to manage these local entities and respond to its development challenges.

5.9 International Good Practice and Lessons for Bangladesh

Participatory Urban Management, Planning and Budgeting

Quality of life in a city largely depends on the way a city is planned and managed. A city performs better in terms of serving its residents if the planning and management processes reflect the opinions and aspirations of the people. If the city residents are empowered to decide on the use of municipal resources for building roads, street paving, cultural initiatives, education, health, sanitation services, etc. city management would become much better in terms of transparency, rational administrative procedures, control of finance, monitoring of governmental performance, and allocation of public resources. These changes would allow the level of investments in the city to increase significantly, which in turn would greatly improve the provision of basic services and indicators of social development.

The city of Porto Alegre in Brazil introduced participatory planning and budgeting during 1990s which was highly successful in drastically improving urban management of the city. The process involves two main roundtable meetings coordinated by the city authority (municipality). These meetings are preceded by several smaller meetings organized by the local communities themselves. Trade unions and professional organizations are also involved through thematic meetings. The first roundtable meeting reviews the progress of public works for which resources were allocated during the previous year. City officials make presentation on the status of public works that were undertaken. Such direct and regular interaction between city officials and the community make it possible to educate the city officials about the wishes of the city residents while at the same time make the citizens aware about the government programmes.

The second roundtable prepares a list of demands based on investment priorities put forward by various communities and elect the council representatives. Various demands for services are then considered by the council and criteria and priorities for budget allocation are determined. The criteria for balancing funding priorities among various communities include total population in a particular community, lack of public services and/or infrastructure in the community and priorities of the community in relation to the city's priorities. The objective of the whole process is to prepare a detailed budget that takes into account needs of various communities and availability of financial resources. The budget proposals developed by the council are then submitted to the Mayor and the City Council for review. The City Council then votes on the budget and sets the level of financial resources that will be available for the next year.

Participatory planning and budgeting process as introduced in the city of Porto Alegre had significant positive effects in terms of functional efficiency of the municipality, improved staff morale, improved monitoring, less waste and delays, reduced costs of public works, and greater transparency with respect to taxes paid and services rendered. All these combined to make additional investment funds available for development of required infrastructure in the city. Within a period of ten short years Porto Alegre's infrastructure noticeably improved, slums were upgraded and housing was provided for the homeless. In other words, quality of life in the city registered significant improvement (Please see the Shanghai Manual for details:

https://sustainabledevelopment.un.org/content/documents/shanghaimanual.pdf).

6. Goals, Objectives and Targets of The 8th Fyp

6.1 Sector-specific objectives and targets vis-à-vis Perspective Plan (2021-2041) goals, objectives and targets

The Perspective Plan2041 envisions Bangladesh as a country reaching high-income status free from poverty by 2041. Urban sector would dominate the economy with about 80 percent of the population living in urban areas which would offer livable environment characterized by a proper balance between ecology, the natural environment and needs of the urban population in terms of quality infrastructure and services. Democratic urban governance system would be in place that would be self -financing and responsive to the needs of the residents.

The 8th Five Year Plan (8th FYP) would serve as an important vehicle for making progress towards achievement of the objectives/targets of the PP2041 during the plan period. The urban sector objectives/targets of the 8th FYP vis-à-vis PP2041 objectives/targets are presented in quantitative terms in table-13

7. Fyp Strategies to Achieve Goals and Objectives

Strategies to achieve the goals and objectives of the 8th Five Year Plan cut across various aspects of urban development including spatial/geographical, Institutional, Infrastructural, Land and Housing, Environment and Disaster Management.

7.1 Spatial Development Strategies

7.1.1 Promoting Balanced Urbanization with Focus on Secondary Cities

One major feature of urbanization in Bangladesh is the over-whelming predominance of the capital city Dhaka which accounts for about 32 percent of the total urban population of Bangladesh. In 1981 Dhaka's share of urban population was only 26 percent indicating that more and more people are migrating to Dhaka than to other urban areas of the country. Dhaka is dominating not only in

Table 13: Sectoral Objectives/Targets of the 8th Five Year Plan and Perspective Plan (2021-41)

Sectoral Objectives/Targets	2018 (Base Year Values)	FY2041 Values (PP2041 Target)	FY2026 Values (8th FYP Target)
Urbanization Pattern			
Share of urban population in total Population (%)	30	80	40
Number of primary cities	2	8	2
Share of Dhaka Metropolitan City in total urban population (%)	33	25	32
Share of 7 other primary cities in total urban population (%)	23	30	24
Urban Basic Services			
Percent of households with electricity	90	100	100
Percent of households with tap water connectivity	40	100	50
Percent of households with water-sealed sanitary toilets	42	100	50
Percentage of households with sewerage connection	5	100	10
Urban Transportation			
Urban streets/ roads with modern traffic signals	N/A	100	
Primary cities with mass transit options	0	8	1
Compliance with parking laws (%)	N/A	100	20
Urban Environmental Improvement and Flood Disaster Management			
Percent of urban centres with modern waste disposal facilities	N/A	100	10
Percent of urban centres with wastewater treatment facilities	N/A	100	10

Green area Dhaka (square kilometer per million people)	N/A	5	1
Green area other 7 major cities (square kilometer per million people)	N/A	12	2
Percent of urban water bodies preserved with 100% compliance with water quality standards	0	100	10
Air quality (annual average, µg/m3 PM 2.5)	86	10	
Percent of cities flood free with proper drainage	0	100	10
Compliance with zoning laws (%)	N/A	100	20
Urban Poverty			
Incidence of urban poverty (%)	15.7	0	10
Percent of household living in slums (UN definition)	55	0	45
Urban Finance			
Share of urban LGI spending in total government spending (%)	5	25	10
Urban LGI spending as percentage of GDP	0.7	8	1.5
Urban LGI taxes as percentage of total taxes	2.3	20	5.0
Urban LGI taxes as a percentage of GDP	0.2	4	0.5

terms of its share of urban population but also in terms of the concentration of civil administration, economy, trade, commerce and industry. Currently Dhaka accounts for about 34% of the country's GDP. Such excessive concentration of population and economic activities has probably exceeded the optimal limits and the ranking of Dhaka by Economist Intelligence Unit as the 4rd lowest city in terms of livability bears ample testimony to this fact. Ahsan (2019) estimated that in 2017 per capita income and GDP in the country were lower by 11.1 % than its potential due to the adverse impact of Dhaka's size on overall urban development.

In view of the negative consequences of Dhaka's overgrowth, the 8th FYP would focus on the development of secondary cities which are medium sized administrative, political, industrial, transportation, tourism and historical centres functioning at a level below primary or metropolitan cities. They range in population from 100,000 to 2.5 million and play a crucial role as economic, social and logistics hubs or centres. Metropolitan cities (such as Dhaka) usually prosper at the expense of smaller cities which have significant potentials to contribute more to national and subnational regional development. It is now widely recognized that systems of secondary cities will have a greater influence upon the economic development of nations and larger geographic regions in the future. There are about 42 secondary cities in Bangladesh. For making the secondary cities more competitive and attractive as places for investment the government would take measures for the development of infrastructure, services, innovation, human capital, good government and strong enabling environments. Special emphasis will be given on the provision of common user facilities (warehousing, infrastructure), development of technology and innovation parks, streamlining import-export approval and clearance, and investment in high quality training, research and development facilities. In addition, steps will be taken to attract private investments in infrastructure and utilities that reduce production and distribution costs within their economies

7.1.2 Promotion of Economic Development Corridor (EDC)

The promotion of economic development corridors within and between countries has become an important focus of attention in recent years. A corridor is a system made up of several components, including infrastructure (roads, railways, ports), transport and logistics services and regulations which include several secondary cities and metropolitan areas. Secondary and metropolitan cities located in the corridor will be planned for development of specialized production, value-adding, export, distribution of goods and services, and logistics hubs. Priority will be given to investment in developing ICT systems and networks, and to soft infrastructure support, such as education and training of SME and micro-business networking.

The government recognizes the importance of hard and soft infrastructure associated with connectivity between systems of cities. Table-14 presents hard and soft elements of connectivity. Modern business establishments require good access to supply chains, transportation systems ports, activity nodes and networks, internet services, analytical skills, and information technologies. The 8th FYP will give special emphasis on the development of hard and soft infrastructure (i.e., roads, rail, air services and political, social, and business networks) for facilitating the flows of materials, people, trade, goods, services, and information among the cities of the development corridor.

Development of EDCs will be helpful in balancing population pressure and distribution of economic development across a range of cities (small, medium and large). Higher efficiency and productivity may also be achieved if appropriate business environment is available in large cities to specialize in knowledge-based and high-tech industries and activities, and in medium and small-sized cities to specialize in agro-based and moderate technology manufacturing industries.

Table 14: Hard and Soft Elements of Connectivity

Elements of hard connectivity		Elements of soft connectivity
Physical	• Road, rail, sea and air infrastructure platforms and network • Postal and freight and passenger services • Utilities (pipelines, electricity and ICT) • Origin-destinations movements	• Internet • Other ICT data • Information systems • E-utility services • E- monitoring
Economic and Trade	• Trade flows • Business documents exchanges • Passenger flows • Business exchange • Tourists • Telecommuting (physical)	• E-finance • E-health • E-services • Marketing and promotion • E-trade and manufacturing • Telecommuting
Social and Cultural	• Education • Visiting friends and relatives • Sports and cultural • Conventions, workshops, and seminars • Cultural exchanges and • events	• E-learning and conferencing • Social and public media • E-library and media • Community networks • Diaspora

Source: Brian H Roberts (2019): Connecting System of Secondary Cities (Cities Alliance and UK aid)

7.2 Institutional Development Strategies

7.2.1 Institutional Reform at the Local Level

The nature of urban governance is of crucial importance since economically, socially and environmentally sustainable urbanization cannot be achieved without institutional arrangements capable of exploiting the economic potentials of cities and towns and combating adverse consequences of rapid urban growth. Urban governance, therefore, should be based on a holistic and comprehensive view of urban development and should encompass institutional strengthening and capacity building, decentralization, community participation, and involvement of the private sector in the development of the urban sector. Institutional reform at the local level, therefore, will focus on the following:

7.2.2 Involving Stakeholders in Planning and Development

The preparation and implementation of Development Programmes require the involvement of all the organizations and institutions which operate at the local level in connection with the development and/or operation and maintenance of infrastructure and services as well as socio-economic development. The coordination and integration of all the efforts of participating organizations including the local government, public sector agencies, private sector actors, non-governmental organizations and the community is needed in order to maximize efficiency and effectiveness of development programs. The local government would be the lead agency for planning exercise and inter-agency coordination.

7.2.3 Coordination across jurisdictions and levels of government in planning

Government institutions are usually organized on a sectoral basis. They often do not coordinate with each other or the local government responsible for managing the urban area. Internal coordination mechanisms are critical to overcome poor coordination of interdepartmental, sectoral, spatial, and financial planning. Plans prepared at different level- regional, metropolitan and city level, need to be mutually consistent and be drawn up through participative processes. Plans need to be 'nested' so that they do not conflict with and actively support the plans made by higher and lower levels of government and in adjacent jurisdictions. Internal institutional arrangements in local government institutions, as well as intergovernmental institutional arrangements and procedures will be rendered more efficient to ensure delivery of services.

7.2.4 Proper definition of Institutional Responsibilities

Clear division of powers and allocation of resources in the major areas of urban planning, development and management across different levels of governments will be ensured so that there is no overlap or gap in implementation of an agreed urban plan. Steps will be taken for clear division of powers and allocation of resources in the major areas of land management, housing and housing finance, municipal infrastructure and services, transportation infrastructure and services, microenterprises and finance, and access to community credit and the judicial system. These divisions should also take place at the municipal level among the various agencies and departments within the municipality.

7.2.5 Capacity Building of Urban Local Government

Capacity building of local government bodies need to focus on strengthening managerial, technical, financial and regulatory capabilities. Capacity building in urban management and municipal finance is extremely important. Capacity building in holding tax administration is also vital as it is a major source of revenue. Further, enhanced capacity in cost accounting systems are needed to control service and monitor cost effectiveness and efficiency. Involving private sectors in urban development activities would also require local governments to build capacity to develop, negotiate, manage, monitor, and enforce a contract instrument. Area specific skills that are very important for enhancing capacity of urban local governments are the following:

- **Managerial:** Policymaking, conflict resolution, establishing administrative and public participation processes, and developing training programs and information systems etc.
- **Technical:** Planning, operations and maintenance in key areas of urban development and management.
- **Regulatory:** revising laws and codes and setting regulatory standards.
- **Financial:** capital budgeting municipal accounting and finance tariff and tax structures, revenue collection procedures etc.

Reducing dependence of Paurashavas and City Corporations on central government agencies would require improving the staff capabilities of these urban local bodies. So long as the central government agencies develop and implement development projects through consultants, it is unlikely that urban local bodies will develop any capability to manage such activities. The urban local bodies, especially, the 'A' class Paurashavas, should determine their staffing patterns in accordance with their own requirements. The emphasis, however, should be on quantitative as well as qualitative aspects. This would require these bodies to go through a process involving determination of volume of work based on functions to be performed, specifying job descriptions for each position including the q1ualifications required, determining staff requirement on the basis of fixed criteria, and deciding the number of positions. It is obvious that professionals such as urban planners, engineers, doctors, veterinary specialists, finance and management professionals, economists, etc. would be required and such requirements should be reflected in the staffing patterns of the Paurashavas.

7.3 Strategies for development of infrastructure and services

7.3.1 Basic urban services

Central government agencies and the local government bodies have the primary responsibility to provide or enable delivery of services. There are, however, a host of other actors, including the private sector, communities and non-governmental organizations that can participate in service provision and management under the coordination of local authorities /urban local bodies. To ensure more equitable provision of basic infrastructure and service delivery system, steps will be taken to establish support mechanisms to enable people living in poverty and the disadvantaged to have access to basic infrastructure and services. Particular emphasis will be given on bringing government closer to the people by decentralizing decision making. It is now well recognized that community involvement

can result in more effective implementation of the project, better design and a reduction in labour and other operational costs. Local communities and other stakeholders will be involved in decision-making and in setting priorities for the provision of services.

7.3.2 Urban transportation

Cities are the major sources of national economic growth while transport is considered as the lifeblood of cities. The transport system is the key to the movement of goods and people and provides accessibility to the jobs, heath, education, and other socio-economic services that are essential to the welfare of the people. Poor transport inhibits growth of cities and makes them dysfunctional. Urban transportation strategies will focus on developing an integrated and balanced transportation system taking into consideration the needs of the road system, non-motorized transport, public passenger transport and mass transit issues such as a city's balance in the locations of employment and housing, demand management, and the roles for the public and private sectors.

Reducing congestion in city roads, especially in Dhaka Metropolitan Area, would depend on considerable reduction of dependency on private automobiles, taxi cabs, baby taxies, and non-motorized transport modes such as rickshaws. Steps, therefore, have been taken to introduce rail-based mass transit system and Bus Rapid Transit in Dhaka. Such systems will also be introduced in other primary cities, especially in Chattogram. Other strategies to address the problems of urban transportation would include the following:

Coordinated land use transport planning

Emphasis will be given to coordinated land-use and transport planning in order to encourage spatial development patterns that facilitate access to such basic necessities as workplaces, schools, health care, markets, places of worship, and leisure, thereby reducing the need to travel.

Strengthening linkages of surrounding cities with Dhaka Metro Area:

One way of easing pressure on housing and transportation sectors of metropolitan areas, especially the capital city, is to strengthen transportation linkages with surrounding urban centres. Comfortable bus and rail-based commuter services will encourage people to stay in surrounding satellite towns and commute to their work places in the city. This will take some pressure off the city roads.

Demand management

When excessive traffic volume (mainly resulting from use of private vehicles) puts extreme pressure on existing infrastructure, demand management may be required to ease the situation. The objective is to reduce traffic volume through such measures as parking prohibitions, fuel pricing, charges for use of specific routes, limiting entry to city centre, encouragement to public transport, pedestrianization of congested areas, etc. Physical measures are usually more acceptable to the public than the economic measures.

Intelligent Transport System

The use of intelligent transport systems, or ITS is an important mark of transport development in cities with relatively advanced systems of transportation. The major application areas of ITS technology include electronic road pricing, traffic management,

integrated ticketing systems for different public transport modes, and traveller information. They enable commuters to plan their trips and avoid unnecessary journeys and congested routes. ITS also allow for the better coordination of public transport modes and online timetables, thereby enhancing the operations and services. By 2031, all the major cities and the national highway networks of Bangladesh should be brought under Intelligent Transportation Systems

7.4 Urban land and housing development strategies

7.4.1 Urban land development and management

Sound land management policies are crucial in solving urban land problems. The government will take appropriate measures to promote sustainable land-use planning and innovative land management practices with particular focus on:

- Developing land information system to support planning and decision-making by local authorities, private sector investments and infrastructure development decisions by the government.
- Using appropriate planning tools (structure/strategic planning, urban/detailed area planning, action planning) for promoting land use patterns in the desired direction.
- Applying participatory approaches to land development to promote efficient and sustainable land development through techniques such as Land Pooling / Readjustment and Guided Land Development

Policy instruments such as land pooling and land readjustment will be used in innovative public-private-community partnerships to manage and coordinate urban expansion. Existing laws regulating transaction, development and access to land will be reviewed and modified to support innovative land development and management practices that facilitate land pooling, land readjustment, guided land development, development of the informal sector and poor's access to land.

7.4.2 Housing Development

The government's main role will be to act as an 'enabler' rather than a provider of housing. The strategies will focus on.

- Helping the Land Market to Work Efficiently
- Creating Efficient Housing Market
- Improving the Mechanism for Financing Housing
- Providing Basic Infrastructure and Services
- Supporting Development of Appropriate Building Materials and Technologies

7.4.3 Housing Loans through Financial Institutions

Housing finance institutions serve the conventional market but do not always respond adequately to the different needs of large segments of the population, particularly those belonging to vulnerable and disadvantaged groups, low-income people and people living in poverty. Steps, therefore, will be taken to enhance the quality of the housing finance system

by making sure that the relevant institutions are physically accessible and offer services that meet the demands of low-income groups. The range of financial institutions will be broadened particularly to cater for the provision of small loans.

7.4.4 Low-Income Housing Loans through Non-Traditional Financing Arrangements

Potential of non-traditional financing arrangements will be harnessed by encouraging communities to form housing and multi-purpose community development cooperatives, especially for the provision of low-cost housing through NGOs and micro-finance institutions. The government will take up low-income housing loan programme for offering loans through community organizations for collective housing development. This will allow for greater efficiency and cost-effectiveness in the production process.

7.4.5 Provision of Infrastructure and Services

The urban poor have limited access to such services as water supply, sanitation (including solid waste management) drainage, flood protection, local roads, public transport, street lighting etc. The government will undertake programmes for physical improvement of the slum/informal settlements that will greatly facilitate the integration of the settlements with the wider urban area and also improve quality of life of their residents.

7.4.6 Rental Housing

Development of rental housing, which caters for the needs of the majority of the low-income households, should be encouraged. This renting ranges from getting and / or sharing a room in a slum area to being provided affordable cluster housing by private developers. Far too often, the emphasis in housing delivery is exclusively on providing home ownership, which does not improve access for those poor urban households who cannot afford to own even basic shelter.

7.5 Environmental and disaster management strategies

7.5.1 Environmental Management

The adverse environmental conditions resulting from inadequate waste management, poor drainage, air pollution, lack of access to safe drinking water and sanitation, exposure to excessive noise levels, as well as inadequate health services not only exact a heavy toll on the quality of life but also causes irreparable damage to natural ecosystems in cities and surrounding areas. Since the environmental problems are complex, multidimensional, and interactive, addressing these problems requires the combined efforts of many actors including the national and local governments, the private sector and the civil society. Environmental improvement during the plan period, therefore, needs to improve the urban environmental management system of the country that:

- Promotes close coordination and cooperation among national environmental management agencies (i.e., Department of Environment) urban local bodies (City Corporations and Paurashavas), non-governmental and private sector organizations;
- Strengthens the environmental impact assessments of urban development projects;

- Builds/improves capacity to integrate environmental dimensions into urban planning and urban development projects; and
- Strengthens the process of environmental monitoring and environmental data collection.

The government would emphasize a holistic and integrated approach, with particular attention to participatory planning and management, public-private partnerships, capacity building and cost-recovery. Specific measures that will be taken during the plan period include:

- Designating all ponds/water bodies in Detailed Area Plan Map of Dhaka and protect them according to the ecological importance and public interest.
- Stopping housing estate, industries and other development work in wetlands through earth filling.
- Avoiding water bodies during planning of roads, housing and industrial estates.
- Enhancing plantation and gardening to increase the natural beauty in urban areas.
- Preserving the wetlands like ponds, beels, khals demarking buffer distance as lakes.
- Avoiding critical ecological area and refuge sites from development works.
- Promoting low/no polluting technology
- Introducing and promoting different environmental improvement initiatives and green initiatives e.g. green building, energy efficient building, zero emission building, green city, etc.
- Introducing environmental audit, energy audit and water audit along with financial audit
- Extending the sewerage network to cover 10% of households in city areas within the plan period and bringing all sewage in treatment plant
- Improvement of Environmental/Ecological Health of Rivers flowing through or near the cities and urban areas e.g. Buriganga, Sitalakkhya, Turag, Balu, Bongshi, Moyuri (in Khulna), Karnaphuli (Chattogram), etc.
- Improvement of public transport- metro rail, Rapid Bus Transit, good rail network, good network of navigable rivers
- Enforcement of Polluter Pay Principle
- Capacity building of DoE in monitoring, investigating, and examining pollution

7.5.2 Climate Change and Disaster Management

One of the key emerging issues that cities and towns are to contend with is climate change, with adverse impacts capable of undermining the ability of cities to achieve sustainable development. Urban areas in the country face a number institutional, planning and governance challenges to address the climate change. These include problems of coordination among various local government institutions and central government agencies, establishing more effective planning and urban management practices that take

into account Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), financing disaster management activities and climate change adaptation, and community participation in disaster preparedness, planning and climate change adaptation. Keeping in view the above-mentioned problems, the government will take following steps during the 8th FYP period:

Strengthening Institutions

- Strengthen City Disaster Management Committee (CDMC) involving other stakeholders such as the private sector, research institutes, national agencies and utility companies.
- Strengthen monitoring and evaluation of the existing mechanisms for compliance and enforcement of laws, regulations etc. through conducting regular capacity building workshops of city personnel. Sensitize legislations, regulations and codes in relation to Climate Change (CC) and Disaster Risk Reduction (DRR).
- Promote close coordination and cooperation among national disaster management and environmental management agencies (i.e. Department of Environment (DoE), department of Disaster Management (DoDM)) urban local bodies (City Corporations and Paurashavas), non-governmental and private sector organizations;
- Integrate city CC-DRR policies and plans in national preparedness and response system. Strengthen partnerships with relevant organizations for technical assistance, researches and techno-environment projects.

Planning

- Prepare and implement integrated, environmentally-sound urban planning and management incorporating environmental and disaster related information and reflecting environmental and disaster management policies and standards. Considerations will also be given to spatial, intersectoral, inter-temporal and environmental media related factors with special attention to key aspects of land and water-use planning.
- Review and update the city's transportation plan to include disaster risk reduction measures (providing accessibility to and linkages with risk-prone areas). Integrate CC-DRR in all key sectors through multi-stakeholder and participatory workshops.
- Establishment of a comprehensive information system that identifies and assesses the risks involved in disaster-prone areas and integrate it into urban planning and design.
- Prepare community-based disaster preparedness and response plans putting emphasis on early warning system that reaches everyone, measures to protect houses, identification of safe evacuation sites and provisions to help those less able to move quickly.

Community Participation

- Enhance disaster preparedness and response capabilities through the contributions of the volunteers, local community groups and non-governmental organizations.
- Facilitate the operation of the disaster preparedness and response mechanisms in a much more coordinated but flexible manner through partnership arrangements with the private sector and in close coordination with all community groups
- Develop Municipal-Community Partnership (MCP) to improve, basic utilities, social services and neighbourhood environment.
- For involving Community Based Organizations (CBOs) in CC-DRRM activities supportive legal framework should be developed and institutional setting should be ensured.
- Financing Adaptation
- Provision of calamity fund by the national government as bridging finance to stimulate disaster management activities with emphasis on CC-DRR both at city and community levels. Institutionalize partnerships between city and external agencies to ensure investment of resources for social protection/DRR.
- Integrate CC-DRR in the city economic policies and plans. Institutionalize collaboration with various external agencies such as private sector, NGOs, foundations, religious groups.
- Conduct study for the feasibility of economic incentives for DRR action and creation of comprehensive assistance package for climate change adaptation.

7.6 Government's Initiatives for Urban Development

7.6.1 Development Programmes for Pourashavas

The government of Bangladesh implemented various projects for improving urban governance and delivering services to urban poor communities. In this respect the development partners provided valuable assistance. One of the earliest attempts to provide the urban poor with basic services was the UNICEF's Slum Improvement Project (SIP) which began in 1982 and was followed later by the Urban Basic Services Delivery Project. Both aimed to improve the delivery of a set of critical basic services to the poor through the establishment of Urban Development Centres (UDC) in poor settlements. From the 1990's onwards the World Bank supported Municipal Services Project (MSP) and the Asian Development Bank (ADB) supported Urban Governance and Infrastructure Improvement Project (UGIIP-1) seeking to improve urban management in a variety of different ways. The Municipal Services Project (MSP) tried to combine strategies that address both the infrastructure-related aspects, and institutional and financial dimensions. UGIIP on the other hand, not only encompassed planned infrastructure development but also institutional capacity building and governance improvement of the Pourashavas.

The Local Partnerships for Urban Poverty Alleviation project (LPUPAP), funded by UNDP and implemented by UNDP and UN-Habitat over the period 2000 to 2007, attempted to provide funds directly to poor communities mainly in the secondary towns. The project has been effective in group formation, community action-planning and mobilization

through community networking. The success of LPUPAP led to a new phase in an attempt to have a greater impact on the urban poor in Bangladesh. DFID supports the new Urban Partnerships for Poverty Reduction Project (UPPR) with £60 million over 7 years (2007-2014). UPPR is designed to directly support the Government of Bangladesh's goal of halving poverty by 2015.

The Second Urban Governance and Infrastructure Improvement Project (UGIIP-2) implemented by the Local Government Engineering Department and supported by GoB, ADB, and GTZ is supporting 35 Pourashavas to prepare Pourashava Development Plans, establish Ward and Town Level Coordination Committees (TLCCs), deploy a Slum Improvement Officer (as introduced by the 2009 Pourashava Ordinance) and spend at least 5% of their budget allocation exclusively for the urban poor under a comprehensive Poverty Reduction Action Plan (PRAP). The performance-based allocation of investment funds in the project creates a strong incentive for Pourashavas to reform their policies and governance.

Third Urban Governance and Infrastructure improvement (sector) Project or UGIIP III is the latest ADB-OFID–GoB financed urban development intervention under LGED. The key objectives of the project entail improvement of infrastructure and service delivery at the Pourashava level and enhancement of the entity's governance parameters. UGIIP III is consistent with the GoB's 7th 5-Year Plan (FY 2016-21) and Outline Perspective Plan 2010-2021. The project is being implemented in 36 pourashavas of Bangladesh with specific objectives to:

- Strengthen pro-poor and gender-responsive urban governance and service delivery in 36 Pourashavas of Bangladesh
- Develop these Pourashavass in an integrated and holistic way both in terms of governance and infrastructure development by improved municipal service delivery, financial sustainability, citizen participation, accountability, inclusiveness, transparency and urban development control

7.6.2 Development Programmes for Addressing Congestion Problems of Dhaka

For addressing the transport problems of Dhaka megacity the government has implemented several flyover project and is currently implementing a metro-rail project. The capital city has witnessed seven flyovers built in and around it over the past 15 years, aiming to mitigate its nagging traffic jams. Seven flyovers --- Mohakhali, Khilgaon, Tejgaon, Banani, Kuril, Jatrabari and Mogbazar-- cumulatively offer an elevated road spanning of 29 kilometers and costing over Tk 4,000 crore. Mayor Mohammad Hanif Flyover, opened in 2013, was constructed at a cost of nearly Tk 2,400 crore, and the 3.1 km-long Kuril Multipurpose Flyover (KMF) project was opened the same year costing nearly Tk 306 crore. The last on this list is Mogbazar-Malibag flyover constructed at a cost of 1,219 crore after budget boost twice was opened in 2017.

Table-15 shows the mass transit facilities planned for Dhaka. 6 MRT lines and 1 BRT line will be completed by 2035 at a cost of about US$23.199 Billion. Construction work of the Tk 22,000-crore Mass Rapid Transit (MRT Line)-6, which began in 2016, has made 38.35 percent progress as of November and is expected to be opened to the public on December 16, 2021.

Table-15: Investment Requirements for Developing Mass Transit Facilities in Dhaka City

Table 15: Investment Requirements for Developing Mass Transit Facilities in Dhaka City*

Projects	Cost (Million US$)	Implementation Period			
		Phase-1 2016 - 2020	Phase-2 2021-2025	Phase- 3 2026-2030	Phase- 4 2031-2035
MRT LINE- 1	8,694	282	2,544	2,934	2,934
MRT LINE- 2	3,748	0	1,499	2,249	0
MRT LINE- 3	400	400	0	0	0
MRT LINE- 4	1,736	0	0	174	1,562
MRT LINE- 5	4,275	0	1,200	800	2,275
MRT LINE- 6	4,089	2000	0	1,253	836
BRT LINE - 7	257	0	0	206	51
Total	**23,199**	**2,682**	**5,243**	**7,616**	**7,658**

Source: JICA AND DTCA-RSTP (2015) * According to Revised Strategic Transport Plan (RSTP)

8. Financing Development and Policy Options

Financing of infrastructure projects has traditionally been the domain of public sector development budget. In the past ten years Government has opened up scope for the private sector to participate in investment undertakings in the private sector. There is now an explicit role of private sector participation in infrastructure financing in Government investment policy and its poverty reduction strategy. A large part of the infrastructure projects for urban development would still require Government interventions. These include in particular those which have high social return but less attractive to private investments. Such projects include water resource management, construction of physical infrastructures, roads and highways and similar investment projects which would yield financial return in the very long run.

8.1 Local Government Resources

All Local Government Institutions (LGIs) have their own sources of revenue. However, these LGIs are characterized by low revenue mobilization capacities which leaves these institutions in constant shortage of funds. The major own sources of revenue of these institutions include taxes, rates, fees and charges imposed by them. Besides, they also receive rents and profits from leased out properties and assets owned by them, and also the sums received by way of providing different types of services. Non-tax revenue sources, although not very common, include contributions from private individuals or entities, grants received from the government, rents and profits received from investments, receipts from charitable trusts placed with local government institutions, loans secured by local government institutions, and proceeds from different services being provided by local government institutions. Holding taxes are the most important source of revenue for local government institutions. In urban areas, local governments can raise on an average 40-50 per cent of their revenue from own sources, but a significant part of their revenue still comes from government grants.

Local governments receive additional assistance through other means as well., municipalities and city corporations also receive such grants for infrastructure development, but these funds are mostly set aside for particular development projects funded by either donors or the central government. In view of public sector budget deficits and competing demand from social sectors LGIs should place more reliance on local sources (in addition to existing sources) as explained below:

8.2 User Fees/Charges

Government agencies may charge users who benefit from services. User charges differ from taxes, in that users pay charges for benefits they receive specifically, whereas taxes are general charges for services that benefit everyone. User charges cover some or all of the cost of a service, depending on the policy goals of government. User charges are designed to generate revenues to cover operating and finance costs as well as to contribute to investment budgets. Revenues generated by the users should be earmarked for capital investment in the services to ensure their continuous provision and necessary extensions. Where possible, user fees should be directly linked to the level of consumption rather than being imposed as monthly charges. Equity should be integrated into a user fee-financed service by offering special programs for those least able to pay, not by lowering price for all consumers but through "lifeline" rates which are set below costs for a minimum level of consumption regarded as basic, then rise with further discretionary usage.

8.3 Betterment levies

Betterment levies are a form of tax or fee levied on land that has gained in value because of public infrastructure investment. They are considered the most direct form of value capture. Betterment levies try to capture part of the infrastructure investment already incurred by the government. Betterment levies are imposed on landowners who are expected to enjoy land-value increases as a result of investment. These levies should be designed to cover the costs of public investment as much as possible. Since the benefits exceed the cost of investment, the landowners are usually left with a private surplus.

8.4 Performance Based Intergovernmental Transfers

In Bangladesh, central Government Grant is an important source of income for the Paurashavas. Such grant supplements the income of a Paurashava from local sources in order to fulfill its functional responsibilities. At present Central Grants are of following types:

a. Direct grants (Non-development grant)

b. Subvention (Salary Support)

c. Matching grants (Linked to Projects)

d. Development grants (Block grants)

Block grants can be used effectively to influence resource enhancing behaviour of Paurashavas. Block grants, therefore, should be distributed on the basis of a fixed formula. The current distribution mechanism of intergovernmental transfers (ADP block grants) in Bangladesh is not based on any formula. A formula based on Area, Population and level of development of the Paurashava could be adopted. Once adopted, it should not be tampered

with or changed for an extended period of time; otherwise, it would lose its effectiveness. For influencing the revenue generation of a Paurashava, allocation of block grant may be done in two stages. In the first stage initial allocation to a Paurashava would be based on the formula. Final allocation could be linked to actual revenue generation of a Paurashava. The final allocation could be more than the initial allocation for Paurashavas with higher revenue collection efficiency while less than the initial allocation for Paurashavas with lower revenue collection efficiency.

8.5 Infrastructure Project Financing by Private Sector

However, there is ample scope for private sector investment participation in a wide range of infrastructure projects. Government has been successful in wooing private investment in power projects, telecommunications, airport maintenance and operation, toll bridge operation, land port development, small renewable energy projects, and other infrastructure projects. Government has now formulated mechanisms and incentives for greater participation of private infrastructure projects through the public private partnership modality. Additionally, Government has recently established clear guidelines on private sector investment in infrastructure projects. International development agencies, particularly World Bank and Asian Development Bank have been proactive partners of the Government in formulating strategies and establishing funding schemes for private investment in infrastructure projects. For instance, the ADB through its private sector financing window has taken investment stake in telecommunications projects as well as large scale manufacturing projects. World Bank has assisted Government in establishing the Infrastructure Development Company Limited (IDCOL) for provision of infrastructure financing. The Bank together with DFID and CIDA have addition ally created the Infrastructure Investment Facilitation Company (IIFC) to provide technical assistance in formulating and developing feasibility studies and business plans for infrastructure projects. These facilities offer considerable scope for catalyzing private sector investment in infrastructure projects in the coastal zone.

8.6 Involving Local Stakeholders in Urban Development

Effective partnerships between local governments and the private sector can generate considerable benefits. Private companies, informal sector enterprises, CBOs, and NGOs can provide urban services, mobilize finance (or voluntary labour), introduce innovative technologies and undertake land development activities. For involving private sector in urban development and management activities supportive legal framework should be developed and institutional setting should be ensured. Private sector actors with whom partnership arrangements can be made include the following:

8.6.1 Community-Based Organizations (CBOs)

These organizations are formed when neighbourhood residents get organized and join forces to improve local security, housing quality, basic utilities, social services and neighbourhood environment. Municipal-community partnership (MCP) has now emerged as an innovative institutional model. MCPs are particularly suitable for delivering specific goods and services, e.g. sanitation, refuse collection, roads and environmental maintenance, social housing etc. MCPs should be developed as part of an overall municipal strategy.

8.6.2 Non-Governmental Organization (NGOs)

Unlike CBOS, non-governmental organizations usually originate outside of the communities with which they work. NGOs may be understood as a "third system" between the public and private, concentrating their support at the community level while at the same time mediating between the community and the government. NGOs are effective agents for building local awareness, for mobilizing community action, enabling access to credit, strengthening CBOs etc. In the context of vast needs, limited capacity and constrained financial resources, the local governments should recognize the role of NGOs as partners in urban development and management activities.

8.6.3 Private Enterprises

These include informal workers and small-scale enterprises as well as large-scale business firms that may be entrusted with the task of operating or developing infrastructure facilities and urban services. The private sector enterprises can play more productive and sustainable roles in urban development by working in partnership with local government, especially in delivering certain urban services, formulating and implementing local economic development strategies and taking part in philanthropic activities for the promotion of social good and environmental quality. An enabling environment, however, should be developed for ensuring participation of private enterprises in urban development and management activities.

8.7 Financing by Development Partners

Foreign aid and development partners (donors) have played an important role in Bangladesh's growth story. Its importance has also been acknowledged by successive governments in Bangladesh. The External Resources Division (ERD) of the government deals with the Bilateral Development Partners along with the Multilateral Development Partners in order to mobilize external economic and technical assistances for the development of the Bangladesh.

Among the several sectors of highest priority for Bangladesh, education, health, poverty reduction, and human development rank as the most integral. Besides the sectors mentioned above, environmental management and gender equity, water and sanitation, urban development, private-sector growth are also extremely important.

The focus of the country's development partners vary -- the World Bank on good governance; Asian Development Bank on agriculture and rural development, energy, infrastructure, and transport development; United Nations Development Programme (UNDP) on SDGs, democratic governance, democratic decentralization, climate change adaptation; the European Commission on human development, good governance, decentralization, economic, and trade development; Japan International Cooperation Agency on capacity building; Department for International Development on poverty reduction, governance

and urban local governance; Swiss Agency for development and cooperation, and Danish International Development Agency on local governance. Three development partners -- World Bank, Asian Development Bank, and Japan government -- account for almost 50-75% of the total external support to Bangladesh in recent years.

The National Policy on Development Cooperation (NPDC) provides the policy framework for mobilizing and managing foreign assistance in Bangladesh. The goal of the National Policy on Development Cooperation (NPDC) is to ensure that foreign assistance follows national development priorities as determined by national development plans and strategies and supports the country's development efforts to bring benefits to the lives of the people.

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8	MDG Action Plan (51 Upazillas) (January 2011)
9	MDG Financing Strategy for Bangladesh (April 2011)
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