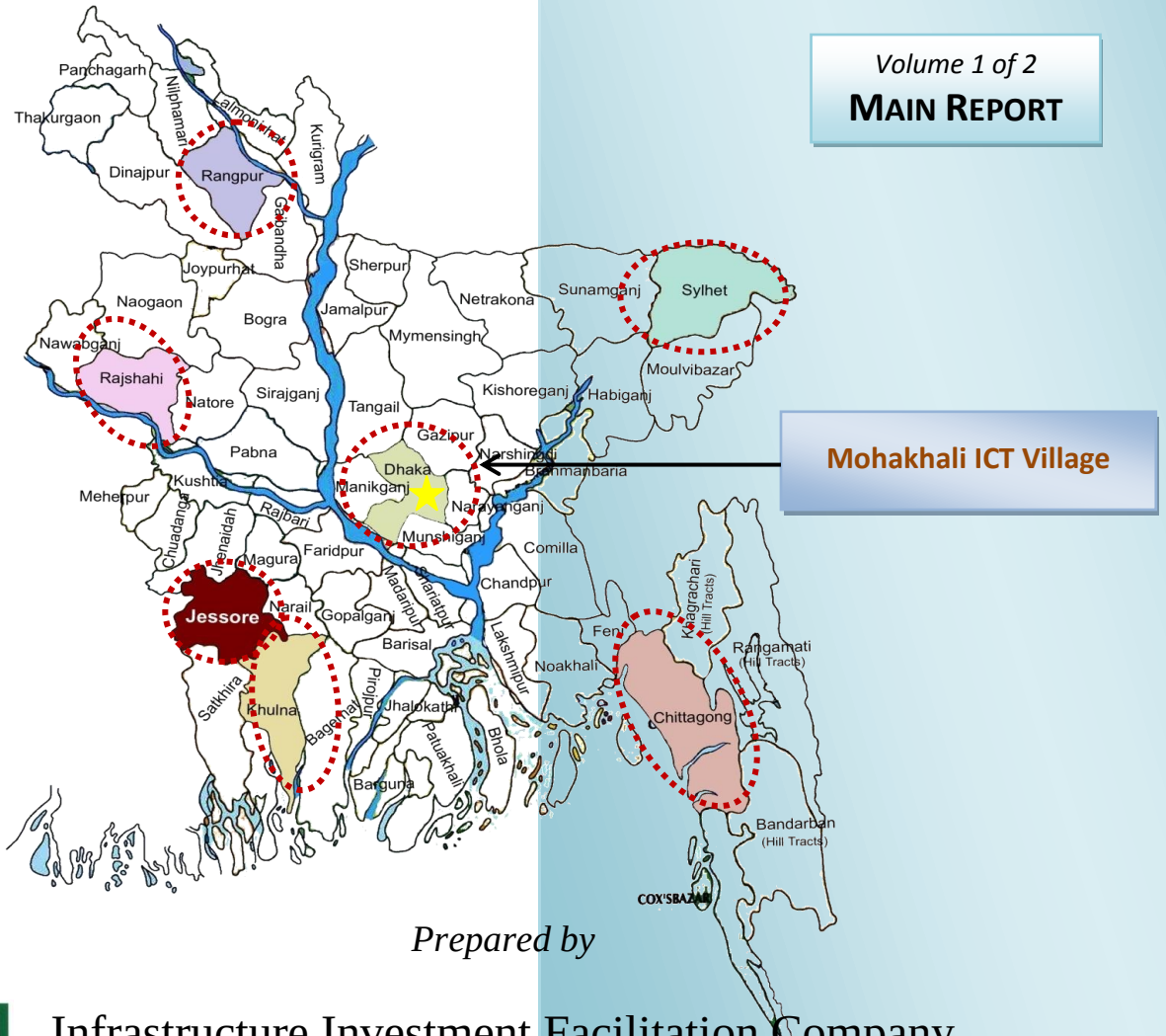
Draft Report

Bangladesh Hi-Tech Park Authority
Information & Communication Technology Division
Ministry of Posts, Telecommunications & Information Technology

Feasibility Study
for
Development of Mohakhali ICT Village

Volume 1 of 2
MAIN REPORT



Mohakhali ICT Village

Prepared by

Infrastructure Investment Facilitation Company
Dhaka, Bangladesh

April 2014

Draft Report

Feasibility Study
for
Development of Mohakhali ICT Village

Bangladesh Hi-Tech Park Authority

Volume 1 of 2

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Feasibility Study for Mohakhali ICT Village

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Acronyms and Abbreviations

ADB	:	Asian Development Bank
ADP	:	Annual Development Programme
AIS	:	Agriculture Information Services
BACCO	:	Bangladesh Call Centre Outsourcing
BANBEIS	:	Bangladesh Bureau of Information and Statistics
BASIS	:	Bangladesh Association of Software and information Services
BCC	:	Bangladesh Computer Council
BCS	:	Bangladesh Computer Samity
BHTPA	:	Bangladesh Hi-Tech Park Authority
BOT	:	Build-Operate Transfer
BPO	:	Business Process Outsourcing
BSCCL	:	Bangladesh Submarine Cable Company
BTCL	:	Bangladesh Telecommunication Company Ltd
BTRC	:	Bangladesh Telecommunication Regulatory Commission
CCCI	:	Chittagong Chamber of Commerce & Industry
CCOAB	:	Cyber Cafe Owners Association of Bangladesh
CIT	:	Computer and Information Technology
CMMI	:	Capability Maturity Model Integration
CPTU	:	Central Procurement Technical Unit
DBS	:	Digital Bangladesh Secretariat
DC	:	Deputy Commissioner's
DESC	:	District e-Service Centre
e-GP	:	Electronic Government Procurement
ERP	:	Enterprise Resource Planning
GIS	:	Geographic Information System
HR	:	Human Resources
ICT	:	Information and Communication Technology

ICX	:	Interconnection Exchange
IDA	:	International Development Association
IGW	:	International Gateway
IIFC	:	Infrastructure Investment Facilitation Company
IIG	:	International Internet Gateway
IMED	:	Implementation Monitoring and Evaluation Division
IP	:	Internet Protocol
IPR	:	Intellectual Property Rights
IPS	:	Inter Process Service
IRR	:	Internal Rate of Return
ISP	:	Internet Service Provider
IT	:	Information Technology
ITeS	:	Information and Technology Enabled Services
LGD	:	Local Government Division
MDG	:	Millennium Development Goals
MFI	:	Micro Finance Institutions
MoPTIT	:	Ministry of Posts, Communications and Information Technology
MTB	:	Multi Tenant Building
NIKS	:	National Information and Knowledge System
PPP	:	Public Private Partnership
PROMIS	:	Procurement Management Information System
PRSP	:	Poverty Reduction Strategy Papers
PSTN	:	Public Switched Telephone Network
SASEC	:	South Asian Sub Regional Economic Cooperation
SICT	:	Support to ICT Task Force
SPV	:	Special Purpose Vehicle
SRDI	:	Soil Resource Development Institute

STP	:	Software Technology Park
TSS	:	Telephone Shilpo Sangtha
UIC	:	Union Information Centre
UISC	:	Union Information Service Centre
UNDP	:	United Nations Development Programme
UP	:	Union Parishads
VGF	:	Viability Gap Fund
VSAT	:	Very Small Aperture Terminal
3G	:	Third Generation

EXECUTIVE SUMMARY

The BHTPA, in its Executive Committee meeting held on 26 April 2012, took a decision of establishing seven ICT villages at the divisional levels of Bangladesh, at Mohakhali, Dhaka and at six other sites at Rajshahi, Rajshahi, Khulna, Sylhet, Rangpur and Chittagong. A Consulting Services Agreement was signed between Bangladesh Hi-Tech Park Authority and IIFC on 30 April 2013 to conduct feasibility studies on the selected sites. In accordance with the Consulting Services Agreement, IIFC has prepared the Feasibility Study for the Development of The Mohakhali ICT Village, as the 4th site of the assignment.

The objective of the ICT Village project is to establish knowledge based industries throughout the country, particularly related to Software and IT Enabled Services, thereby contributing to the national economy and helping achieve the goals of Vision 2021: Digital Bangladesh. The Government of Bangladesh intends to create basic infrastructure for establishing the IT Park in Sylhet, and has allocated 47 acres of land for its development. This land will be used to develop a world-class business environment, conducive for IT/ITES industry. This ICT village will attract investments from both foreign and local entrepreneurs.

Bangladesh ICT Industry

The IT/ITES industry is one of the fastest growing industries in the world. The local industry serves both domestic and international markets and is playing an increasingly prominent role in Bangladesh's economy. There are over 800 registered software and ITES companies in Bangladesh, as well as a few hundred more small unregistered companies (BASIS). Out of the total IT/ITES industry valued at approximately USD 800 million (BASIS survey), the software industry takes up 39% (USD 117 million). Recently there has been strong growth in freelancing, where young professionals directly serve overseas clients. These professionals mainly work from home and do not own registered companies. According to BASIS, there are about 10,000 freelance professionals in Bangladesh.

The local market is the predominant source of business for the software and IT service industry (63% of BASIS member companies are solely focused only in the local market). There has been a consistent growth, in the local market, of 20-30% over the last few years (WB Report). The global IT/ITES market continues to grow and due to its large market size, there is a huge potential for Bangladesh to grab additional market share. Investment in ICT sector is provided through Public sector, Foreign Direct investment and Private sources. Public sector investment comes from the Annual Development Programme (ADP), while private sector investment is made through private Banks and Joint venture companies. Foreign Direct Investment in ICT sector is mainly concentrated in the Telephone and Mobile industries.

The government of Bangladesh emphasizes the need for a comprehensive Master Plan in order to achieve an overall development of the ICT sector. This Master Plan is being developed according to a framework based on Vision 2021 and ICT Policy 2009. At the centre of the proposed framework will be the National Information and Knowledge system (NIKS), a platform for developing and delivering services to citizens in both rural and urban areas.

Different Ministries and agencies; Ministry of Posts, Telecommunications and Information Technology, Ministry of Law and Justice and Parliamentary Affairs, Ministry of Information, Ministry of Commerce, Ministry of Education, Planning Division, Bangladesh Computer Council, Bangladesh Telecommunication Regulation Commission, Bangladesh Hi- Tech Park Authority etc are involved with the ICT sector in Bangladesh. There are eight Regulatory Authorities involved in enabling the development of ICT businesses, Ministry of Posts, telecommunications and Information Technology, Bangladesh Computer Council, Bangladesh Hi-Tech Park Authority, Ministry of Commerce, Ministry of Information, Bangladesh Bank, and the Bangladesh Telecommunication Regulatory Commission. The Government of Bangladesh provides legal support to the entire system through different acts including ICT act, IPR protection, authorization of digital signatures, e-banking facilities for e transaction, e commerce, e procurement etc.

Demography: Dhaka Division

Dhaka Division is one of the seven administrative divisions of Bangladesh. It is made up of 17 districts, and is the location of Bangladesh's capital city Dhaka. The division covers an area of 31,177.74 km², and has a population of 49,321,688 (Adjusted) as per 2011 Census. Dhaka Division is bounded by the Indian state of Meghalaya to the north, Barisal Division to the south, Chittagong Division to the south-east, Sylhet Division to the east, Rangpur Division to the north-west, and Rajshahi and Khulna Divisions to the west. The population densities of Dhaka division and Dhaka Zilla are 1,521 per km² and 8,229 per km² respectively. The "Population and Housing Census 2011" conducted by the Bangladesh Bureau of Statistics, found that 13,0,99,840 individuals, or 26.56% of the population of Dhaka Division fall in the 15-29 age group.

While the average literacy rate in Dhaka Division is 54.2%, higher literacy rates prevail in Dhaka (70.5%), Gazipur (62.5%), Gopalgonj (58.1%), Narayongonj (57.1%) and Munshigonj (56.15%). The "Population and Housing Census 2011" conducted by the Bangladesh Bureau of Statistics, found that 13,0,99,840 individuals, or 26.56% of the population of Dhaka Division fall in the 15-29 age group. Out of this group, 23.66 lacs are students including, 13.37 lac males and 10.29 lac females. This represents quite a large untapped pool of talent that can benefit the IT/ITES industry.

In Dhaka, 97% of households use electricity as a source of light, and there are approximately 727,193 individuals (65.2% male and 34.8% female) with access to internet in Dhaka (BBS, 2011). Additionally, about 85 lakh persons (48.2% male and 51.8% female) watch Television regularly. The government of Bangladesh recently introduced one stop citizen service in all Deputy Commissioner's offices across the country, including Dhaka zila. Citizens of Dhaka therefore have access to and can submit documents online; those without internet access can do so through local e-service centres.

There are 22 public and 53 private universities in Dhaka Division offering four year degree programmes in IT and its related fields. Together these 75 institutions have around 51,758 students enrolled in their programmes. Additionally, there are 132 Polytechnic Institutes (11 public and 121 private) offering Diploma programs in ICT, with enrolment figures of around 10,146. Assuming a graduation rate of 20%, these institutes together produce around 11,900 graduates with IT and IT related Degrees/Diplomas annually. With this large pool of talent, there appears to be significant scope for expanding the employment in the ICT sector. However, the challenge identified is the need for professional training in key skills and for reducing the skills gap between the education system's output and industry requirements at an adequate scale.

The Project Site

In 1989, 90 acres of land was allocated to the Public Works Department (PWD) out of a total 170.4 acres in Mohakhali-Lalasharai-Karail Mouza, owned by the BTTB (which was converted to BTCL in 2008). The purpose of the allocation was to establish government buildings. The ruling government at that time also allowed slum settlements for 3rd and 4th class employees of BTTB on the same land. This gradually grew into the Karail Slum, currently one of the largest slums in South Asia. In December 1999, 47 acres out of the 90 acres PWD land, was transferred to the Ministry of Science and Information & Communication Technology (MoSICT), with the intention of establishing an ICT Village.

The site is located at 23°47' 7" N to 90°24'45" E in Dhaka City. It is like a peninsula surrounded by the Banani Lake on three sides. It is bounded by Banani Road No. 5 to the north and by the Gulshan-Banani Lake to the east. BRAC Centre lies to the south of the site, while the T&T Colony and BTCL Satellite Office are situated on the west side. In short, it can be said that the site is bounded by the following distinctive landmarks:

- To the North: Banani Road
- To the South: BRAC Center
- To the East: Gulshan-Banani Lake
- To the West: T&T Satellite

The land area of the proposed site for the development of Mohakhali ICT Village is 47 acres. The site as mentioned before is currently occupied by a portion of the Karail slum. The resettlement of the slum inhabitants represents a major challenge for the project.

The site is accessible through two pathways and one waterway. The main access road is Banani Road No. 5, which connects the site to the north. The other road is a narrow walkway that links the site with a local street called Adeal Road to the southwest corner. To the south, lies Banani Lake, which provides access to the site by means of small passenger boats. Both Adeal Road and the water access route directly connect with Bir Uttam AK Khandaker Road, which is the main connecting route between Mohakhali and Gulshan. Additionally, both Banani Road No. 5 and the Bir Uttam AK Khandaker Road eventually link up with the Dhaka-Mymensingh Highway.

The Gulshan S&D is the concerned division under Dhaka Electric Supply Company Limited (DESCO) responsible for supplying electricity to the project site and the surrounding areas. The nearest sub-station (33/11 kV) is located in Banani Road No.1, 1.3 km from the site. The second nearest substation (33/11 kV) located at Gulshan 1, is about 3 km away.

Market Survey

To explore the market demand and industry trends of ICT industries for the development of the Mohakhali ICT Village, IIFC surveyed Dhaka based ICT companies. Bangladesh Association of Software and Information Services (BASIS) has 800 member companies based in Dhaka. IIFC has considered these listed companies as the total population of ICT companies in Dhaka. For the purpose of the survey, a sample size of 50 companies was selected, representing 6% of the total population.

IIFC formed a survey team consisting of 5-6 people. The team conducted face to face interviews with personnel from the 50 selected ICT Companies (both software and hardware development) located in Dhaka. Apart from the ICT companies, the team also surveyed 22 freelancers with an online survey form. In choosing companies for the survey, IIFC considered organizations with the mix of the following types of businesses.

1. Software Development and Services,
2. Business Process Outsourcing,
3. ICT Training,
4. Hardware Sales and Services and
5. Other

According to survey findings, 25% of companies in Dhaka fall within the income range of USD 0-150,000 (upto Tk. 1.2 cr). A majority (31% of companies) reported incomes of USD 150,000-650,000 (Tk. 1.2-5cr). 14% of the companies

earned USD 650,000-1.25 m (Tk. 5-10cr) and 1.25-3 m (Tk. 10-25cr). Very few companies fall within the income range of > 3 m (>Tk. 25 cr).

The office space rental rate in Dhaka was found to be around Tk. 54 per sft, which is comparatively high. Electricity bill and fuel cost were found to be relatively high, as were average bandwidth costs. This is mainly because of the high demand for such services in the capital city.

The survey team found eagerness amongst the ICT companies to improve the quality of their products and services, and a desire to expand their domestic and international business. They felt tremendous confidence among the ICT companies, and an overwhelming interest for moving to an ICT Village.

In terms of space requirements, most of the companies responded to needing office space of 2000 sft and above. The availability of reliable power supply appeared the highest priority need of ICT companies in Dhaka. Fiscal incentives, cheap rent/ cost of land, reliable internet connectivity, and secured business environment, were the next highest requirements for companies wising to do business at the ICT village. The availability of qualified professionals/ graduates, a strong customer base and value-added services (Market access, business planning and operational support, or resource mobilization) were the three lowest ranked requirements.

The two most important ancillary facilities include the availability of R&D and Training Centres. These are followed by the demand for conference halls, single window service provision, and 24/7 technical support, along with cafeteria and residential facilities, which were ranked similarly in importance. The availability of a commercial complex in the ICT Village is the least important factor for Dhaka based companies.

For the surveyed freelancers, reliable internet connectivity in the ICT Village stood out as the most important factor. The next items include the availability of a strong customer base, reliable power supply and fiscal incentives. Cheap rent/ cost of land, secured business environment, value-added services (Market access, business planning and operational support, or resource mobilization) were ranked the lowest.

In terms of ancillary services, the availability of training centre was ranked the highest by the freelancers. Having 24/7 technical support, conference hall, and R&D Centre were the next priorities. Residential facilities, Single Window Service were the other factors, with last two being given similar importance. The availability of a Commercial Complex (shopping mall etc) in the park and Cafeteria were the two lowest ranked options.

Demand Forecast

The demand forecast for Mohakhali was carried out with inputs from the market survey. Based on historical data of sample industry volume and their

trend of growth rate, the forecast growth rates are determined for a period of thirty years. From the surveyed data, three different factors have been generated:

1. Factor for Space Requirement per person (SRP) - (sft/person),
2. Revenue Earning Factor (REF) - (Tk. m/person) and
3. Bandwidth Capacity Factor (BCF) - (Mbps/person).

Based on these factors, the demand for space requirement (sft/Tk m), employment generation (person/Tk. m) and bandwidth requirement (Mbps/Tk. m) of Bangladesh ICT Industry for a period of thirty years have been determined.

The volume of the Dhaka based ICT Industry is considered as 82% of Bangladesh's entire ICT Industry. The volume for Mohakhali ICT Village in turn is considered as 85% of the total Dhaka industry. This is derived for a period of thirty years using forecasted growth rates. Based on this industry volume, the space and bandwidth requirement and employment generation of the Mohakhali ICT Village have been generated.

The core leasable area of the Village includes two Multi-Tenant Buildings (MTBs):

1. Multi Tenant Building (MTB) No. 1
2. Multi Tenant Building (MTB) No. 2

The total area of MTB No. 1 is 985,600 sft. Based on the demand forecast under different scenarios, the occupancy rates for this building are given below.

Table 1: Demand Projection for MTB No. 1 in Different Scenarios

Scenarios	Space Requirement (sft) of Mohakhali ICT Village for MTB No 1						
	Y1	Y2	Y3	Y4	Y5	Y6	Y7
Base Case	797,917	894,648	1,003,369	-			
Optimistic Case	956,633	1,101,160	-	-			
Conservative Case	791,963	859,123	932,640	1,013,136			

The above table shows that, the demand for space of 985,600 sft will be filled up within 3 years in base case, 2 years in optimistic case and 4 years in conservative case. Given the overall demand, a three (3) years take-up would seem to be realistic. The occupancy rates assumed in three cases are provided in the following table:

Table 2: Occupancy Rates for MTB No. 1 in Different Scenarios

	New Occupancies		
	Base Case	**Optimistic Case**	**Conservative Case**
yr1	35%	50%	25%
yr2	35%	45%	25%
yr3	25%	-	25%
yr4	-	-	20%
Total	**95%**	**95%**	**95%**

It is assumed that balance 5% of the space will not be occupied most of the time due to changing tenants.

MTB No. 2 has a total area of 985,600 sft. Its occupancy rates under different demand scenarios are outlined in the table below.

Table 3: Demand Projection for MTB No. 2 in Different Scenarios

Scenarios	Space Requirement (sft) of Mohakhali ICT Village for MTB No 2												
	Y1	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**	**Y11**	**Y12**	**Y13**
Base Case	-	1,125,584	1,262,990	1,404,159	1,562,582	1,740,625	1,941,019	-	-	-	-	-	-
Optimistic Case	1,267,842	1,460,109	1,681,926	1,920,801	-	-	-	-	-	-	-	-	-
Conservative Case	-	-	1,101,294	1,174,764	1,253,197	1,336,930	1,426,324	1,521,767	1,597,100	1,676,171	1,759,163	1,846,272	1,937,703

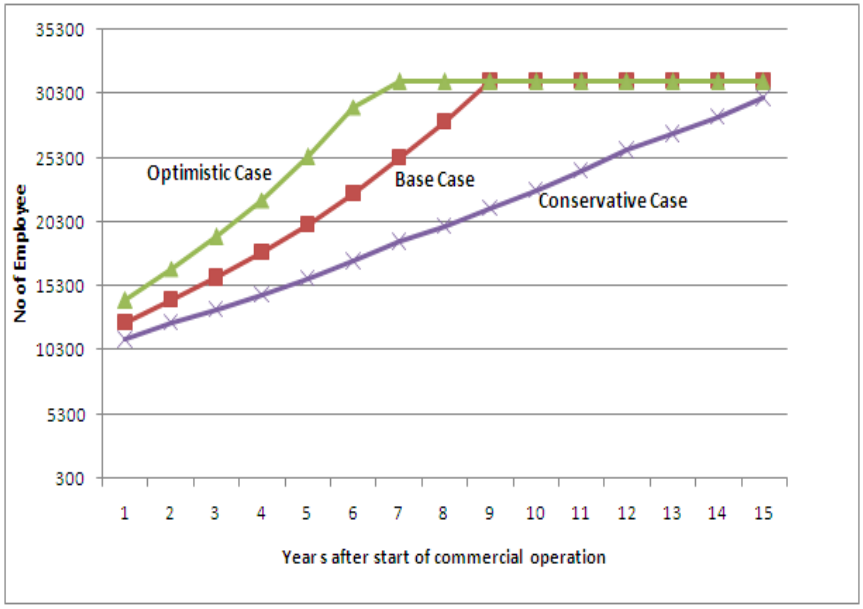
The above table shows that, the demand for space of 1,971,200 sft will be filled up within 7 years in base case, 4 years in optimistic case and 13 years in conservative case. The occupancy rates assumed in three cases are provided in the following table

Table 4: Occupancy Rates in Different Scenarios

	New Occupancies		
	Base Case	**Optimistic Case**	**Conservative Case**
yr1	0%	25%	0%
yr2	20%	25%	0%
yr3	15%	25%	10%
yr4	15%	20%	10%
yr5	15%	-	10%
yr6	15%	-	10%
yr7	15%	-	8%
yr8	-	-	8%
yr9	-	-	8%
yr10	-	-	8%
yr11	-	-	8%
yr12	-	-	8%
yr13	-	-	7%
Total	**95%**	**95%**	**95%**

The ICT village will generate significant employment for Dhaka. Most of the new employment will arise from investments that would not have otherwise been made without the existence of the village. The following figure provides a profile of potential employment generation.

Figure 1: Potential Employment Generation through ICT Village



Technical Planning and Design

The project site is situated just beside the Mohakhali-Gulshan road, crossing the lake at the bridge over the lake near BRAC Inn building. Present accessibility to site from this point is by boat only. A road bridge is proposed to be constructed at this point across the lake for easy access to the site from main road. The land at site is relatively high and does not need much land-filling. However, some low land is to be developed through land-filling.

The total project area of is 47 acre, out of which 2.5 acre falls in water within the lake. The remaining 44.50 acre of land is divided into following 6 zones. This include the main road of 2 acre which is the central passing though the project land and is not in any zone. The following Table provides the land allocation of the project area for different zones.

Sl.	Zone	Zone Name	Area in acre
1	Zone-1	ICT Business zone	18.00
2	Zone-2	Hotel Business Zone	3.25
3	Zone-3	Convention & Training Centers	2.00
4	Zone-4	Residential Zone	16.50
5	Zone-5	Recreational Zone	1.00
6	Zone-6	Administrative Zone	1.75
		Land in Central Road	2.00
		Total Land	**44.50**

Suggested buildings in different zones are listed below. These are only indicative, and are to be finalised as per requirement of the time, by BHTPA and the selected private sector or investor.

1. **ICT Business Zone**
   - i. Multi Tenant Building, MTB-1
   - ii. Multi Tenant Building, MTB-2
2. **Hotel Business Zone**
   - i. 5 Star Hotel Building 1
   - ii. 5 Star Hotel Building-2
3. **Convention & Training Centers**
   - i. Convention Center
   - ii. Training Center-1
   - iii. Training Centers-2
4. **Residential Zone**
   - i. Dormitory Building -1
   - ii. Dormitory Building -2
   - iii. 4 Residential Buildings-Block-A
   - iv. 4 Residential Buildings-Block-B
5. **Recreational Zone**
   - i. Amphitheater
   - ii. Boat Club Building

6. Administrative Zone

i. Administrative Building

ii. Gate House & Reception Building

The following list gives the proposed buildings provided in the Masterplan, with floor area and number of floors of each building.

	Building	Floor area (sft)	No. of floors	No. of Bldgs.	Total area (sft)
1	Administrative Building	10,000	5	1	50,000
2	Gate House & Reception	3,000	2	1	6,000
3	Multi Tenant Buildings	50,000	30	2	3,000,000
4	Hotel Buildings	25,000	20	2	1,000,000
5	Training Centers	12,000	10	2	240,000
6	Convention Center	15,000	3	1	45,000
7	Residential Buildings	25,000	8	8	1,600,00
8	Dormitory Buildings	6,000	6	2	72,000
9	Amphitheater	10,000	1	1	10,000
10	Boat Club	10,000	2	1	20,000

For different types of resettlement /relocation options of Project Affected Persons (PAPs), 6 different options have been considered in the project planning. The options are as follows:

1. Option I: Resettlement by GoB with Cash Compensation
2. Option II: Resettlement by PPP Investor with Cash Compensation
3. Option III: Off-site Resettlement in by PPP Investor
4. Option IV: Off-site Resettlement by PPP Investor, with Real Estate
5. Option V: On-site Resettlement by PPP Investor with Real Estate
6. Option VI: Resettlement of Entire Karail Area by PPP Investor

Considering different modes of resettlement of PAPs, 3 different project layout plans have been prepared for the Mohakhali ICT village site.

Layout -1 (For Options I, II and III)

In the options I, II, and III, the entire land of the project site (net 44.50 acre) will be used for ICT village development.

Layout -2 (For Option IV)

In this option the resettlement cost is to be borne by PPP Investor through real estate business. To offset the cost of construction of 1,545 number of economy flats outside the project land for the PAPs, 2 buildings of Premium Housing will be built by the PPP Investor in the project land. BHTPA will allow 0.5 acre of land of the project site for this purpose. And total 44 acre of land will be available for the ICT Village.

Layout -3: (For Option V)

In this option, on-site resettlement of PAPs is provided in 47 nos. buildings in 'Economy Housing Enclave' within the project site. This will require an area of 9 acres, for construction of 6,768 economy flats in 47 Economy Housing buildings of 10 floors each. The cost of economy houses will be set-off by development of Real Estate of 480 nos. of Premium Apartments in 12 nos. 10 storied buildings, on an area of 4 acres. In this option, the ICT village will be constructed on an area of 31.50 acre land.

The Option VI needs more survey and study and is beyond scope of this report.

The following Table gives a tentative space allocation or floor area distribution of the Multi-tenant Building.

Table 5: MTB Floors Distribution Table

Space use	Location Block	No. of Floors	Floor area (sft)	Remarks
Core Business				73%
BPO (Call Centers)	A, B	5.5	246,400	
Other ICT Units	A, B	1	44,800	
Training Centers	B	0.5	22,400	
Software Development Area	A, B	15	672,000	
Sub total			**985,600**	
Non-Core Business				17%
Banks	A, B	1	44,800	
Data Centre	A, B	2	89,600	
Conference Hall	A	0.5	22,400	
Food Court	A, B	1.5	67,200	
Sub total			**224,000**	

Space use	Location	No. of	Floor area	Remarks
	Block	Floors	(sft)	
Others				10%
Admin. Offices	A, B	1	44,800	
Meeting Rooms	A	0.5	22,400	
Research (R& D) Area	A, B	1	44,800	
Storage Room	B	0.25	11,200	
Mosque	B	0.25	11,200	
		Sub total	**134,400**	
Total floor Area (A+B)		30	**1,344,000**	100%
Common space /Utility	Block C	30	156,000	
(Foyer, Lobby, Fresh rooms, etc.)				
Total building area per floor (A+B+C)			**150,000**	

The MTB and other building of Mohakhali ICT village have been designed as standard RCC frame structural building. This means that the whole building is built with RCC column and beam frame structure. The floors and roofs are also made of conventional RCC structure.

Capital Cost Estimates

Total capital cost of the project is estimated to be Tk 17,956 million (2013 Tk).

Table 6: Total Capital Cost Estimate

	ZONE	Cost (Tk million)	Develop-ment by Private Sector	Develop-ment by Public Sector
1	Zone-1 (ICT Business)	12,638.08	12,638.08	-
2	Zone -2 (Hotel Business)	3,289.42	3,289.42	-
3	Zone -3 (Convention & Training Centers)	926.71	926.71	-
4	Zone -4 (Residential)	644.32	644.32	

	ZONE	Cost (Tk million)	Develop-ment by Private Sector	Develop-ment by Public Sector
5	Zone -5 (Recreational)	90.66	90.66	-
6	Zone -6 (Administrative)	367.16	-	367.16
	Total Cost	**17,956**	**17,589.19**	**367.16**

Investment Models

The ICT Village may be financed through government fund or Public Private Partnership. Government funding may come from the Bangladesh government's own funds or donor funds. Development of ICT village through PPP may occur for the entire village or for its O&M only.

The critical factor in choosing an institutional option lies with the mode and financing of acquisition or purchase of land for developing the village. The institutional option varies with different levels of participation from government and private sector. The following table provides a comparison of options in terms of land development, financing, on-site development, regulation and operating and managing the ICT village.

Table 7: Comparison of Options

Criteria for Comparison	Option A: Government Led Model	Option B: O&M Outsourcing Model	Option C: Concession PPP Model (BOT)	Option D: Concession PPP Model with VGF	Option E: Leasehold Transfer Model
Land Acquisition	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Off-site Development	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Land Development	BHTPA	BHTPA	PPP Investor	PPP Investor	PPP Investor
Overall Layout (Preliminary)	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA

Criteria for Comparison	Option A: Government Led Model	Option B: O&M Outsourcing Model	Option C: Concession PPP Model (BOT)	Option D: Concession PPP Model with VGF	Option E: Leasehold Transfer Model
Overall Layout (Final)	BHTPA	BHTPA	PPP Investor	PPP Investor	PPP Investor
Financing and Construction	BHTPA	BHTPA	PPP Investor	PPP Investor	PPP Investor
O&M	BHTPA	PPP Investor	PPP Investor	PPP Investor	PPP Investor

PPP Investor Selector Process and Criteria

Engaging a private operator is typically a step-by-step process. The Private Operator selection process will start with a Request for Qualification (RFQ) by BHTPA. After the feasibility study is finalized, BHTPA will issue a public notice for inviting investors to submit qualification statements for participating in the investment. A short list of the qualified Private Operators will be made, based on evaluation of the statements. After the approval of the short list is obtained, the tendering process will start with the issuance of Request for Proposal (RFP). RFP will be issued to the pre-qualified Private Operators for selecting and ranking the most suitable candidates. The selected private operator will enter into an agreement with BHTPA, who will provide them with the layout, conceptual design of the facilities and land designation.

The final investor selection will be made based on evaluation of the proposals and subsequent approval of the relevant authorities. The potential Private operator is expected to have the following competencies and abilities:

a. Good knowledge of operation and maintenance of hotel or tourism facilities.
b. Ownership and operation experience of companies operating facilities of similar size
c. Knowledge of laws, rules, and regulations governing O&M of such facilities
d. Working knowledge of the operation and maintenance of commercial complexes
e. Ability to prepare forms and narrative inspection reports.

The potential private operators will be evaluated based on the following minimum qualification test criteria. The tests will be performed in two parts:

1. Part I Evaluation – Qualification Test
2. Part II Evaluation – Financial Ranking

The bids will be ranked based on the financial score or a combination of the technical score and financial score, which will be designed in the RFP stage.

Financial Analysis

The financial model has been prepared based on the perspective of the PPP Investor under a PPP model. Under the PPP model, the PPP Investor will sign a PPP Contract with BHTPA, under which it will be responsible for development and operation of Zone 1: ICT Business Zone, including construction of Multi Tenant Buildings (MTBs) and construction of internal infrastructure such as internal roads, drains etc. Zone 2 – Zone 5 may be contracted out to other PPP Investors by BHTPA under separate agreements. Zone 6 will be developed by BHTPA with government fund. In addition, BHTPA will be responsible for regulation of the ICT village.

Zone 1 of the ICT Village consists of two 30-storey MTB buildings. It is expected that the buildings will be built in two phases. Multi Tenant Building 1 (MTB1) will be constructed at land handover in Phase I. Internal roads and utilities will also be constructed in Phase I. Once 75% of the leasable spaces in MTB1 have been taken up construction of MTB2 will begin (Phase II).

Total capital cost for PPP investor for Zone 1 in the base case is estimated to be **Tk 14,570 million** (2014 Tk)**.** The above cost estimate is based on the assumption that Social Resettlement Option V: Onsite Resettlement by PPP Investor is chosen. In that option, social resettlement cost for the project is zero as the PPP Investor will use the proceeds from his real estate business to pay for social resettlement. Social resettlement cost estimates for different Options is given in Table 12.10 and discussed in more detail in the Broad Resettlement Framework.

Table 8 : Social Resettlement Cost Estimates

Resettlement Cost to be financed by Project	
	m Tk
Option I: Resettlement by Cash from GoB	0
Option II: Resettlement by Cash from PPP Investor	496
Option III: Off-site Resettlement by PPP Investor	1,304
Option IV: Off-site Resettlement by PPP Investor with Real Estate	0
Option V: On-site Resettlement by PPP Investor	0

If Option II or Option III is not chosen for social resettlement, the additional amounts given in the table above will be added to the capital cost estimate.

The base case investment model is Option C: Concession PPP Model. In the base case model it is assumed that resettlement Option V will be chosen by BHTPA.

Key parameters for the base case scenario are presented in Table 8.

Table 9 : Overview of Key Parameters in Option C

Category	Parameter
Investment Model	**Option C: Concession PPP Model**
Term	30 years from land handover
Resettlement Model	Option V: On-site Resettlement by PPP Investor
Social Resettlement Period	4 years
Construction Start	
Phase I	2019
Phase II	2021
Commercial Operation Date	
Phase I	2021
Phase II	2024
Land Area	44.5 acres
Leasable Area	
Zone 1	1.2 million sft
Number of ICT Units at the Village	1,314
Type of ICT units to be located at the ICT Village	• Software Development and Services • Business Process Outsourcing • Training Center • Other ICT services
Size of MTB office spaces for lease	1,500 sft
Lease Rates	
ICT Office Space, BPO offices and Training Centres	Tk 70 /sft/mon
Data Center, Cafeteria, Bank,	Tk 80 /sft/mon
Conference Hall	Tk 15,000 / day
Lease Rate Escalation	6% per year
O&M Service Charge	Tk 2.50 /sft/month
Royalty	Upfront: Tk 5 million Yearly: 2% of gross revenue

Category	Parameter
Tax Exmption	1st ten years
Debt/ Equity Ratio	75:25
Loan Component	80% IPFF Loan, 20% PFI loan (commercial banks)
Loan Term	
IPFF	20 years
PFI (Commercial Banks)	7 years
Grace Period for Loan Repayment	
IPFF	7 years
PFI (Commercial Banks)	3 years
Interest Rate	
IPFF	9.45%
PFI (Commercial Banks)	14.45%

Approximate share of revenue for each revenue source is shown in Table 12.19 and Figure 12.11.

Table 10 : Revenue Items in Option C

Facilities	Share of Revenue
Software Development and Services units	55%
BPO units	20%
Training Center	2%
Other ICT units	3%
Data Center	7%
Banks	4%
Conference Hall	1%
Food Court	5%
O&M Service Charge from Tenants	3%

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA's land for his business. Royalty payment will be in two forms:

- Upfront payment of **Tk 5 million** at signing of PPP Contract
- Yearly payment of **2% of Gross Revenue**

The upfront payment will be paid to BHTPA in 5 equal installments during the first five years.

The result of financial analysis are presented in the following table:

Table 11: Key Financial Indicators in the Base Case Scenario

Output	
Equity IRR	**15.39%**
Project IRR	**11.81%**
Royalty Received by Government	
First 10 years (mil Tk)	**356**
Full Term of Contract (mil Tk)	**3,583**
DSCR	
Average	**1.62**
Maximum	2.87
Minimum	0.63
Equity Payback Period (year)	**13**
Project Payback Period (year)	**11**

Financial analysis of **Option D: PPP Concession Model with VGF** was also conducted. Under Option D, BHTPA will handle the development of land and off-site infrastructure and rehabilitation of inhabitants of the project site. The PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. It will be responsible for implementing the project, which includes the development, financing, and construction of Zone 1 including the Multi-Tenant Buildings, as well as the operation and maintenance of Zone 1 during the concession period. The concession period for this project is 50 years. Since the financial viability of the project is not ensured, Viability Gap Funding (VGF) in the amount of 30% of the estimated project cost will be provided by the Government to the PPP Investor.

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA land for his business. Royalty payment will be in two forms:

- Upfront payment of Tk 5 million at signing of PPP Contract
- Yearly payment of 2% of Gross Revenue

The upfront payment will be paid to BHTPA in 5 equal installments during the first five years.

Key financial indicators of the project Under Option D are presented in the following table

Table 12: Key Financial Indicators under Option D

Output	
Equity IRR	**27.18%**
Project IRR	**18.37%**
Royalty Received by Government	
First 10 years (mil Tk)	**356**
Full Term of Contract (mil Tk)	**13,932**
DSCR	
Average	**2.14**
Maximum	3.82
Minimum	0.85
Equity Payback Period (year)	**8**
Project Payback Period (year)	**9**

Implementing the project under Option D gives a 27% return on Equity which is much higher than in Option C. However, significant Government funding in the form of VGF is required.

Financial analysis of **Option E: Leasehold Transfer Model** was also conducted. Under Option E: Leasehold Transfer Model, the PPP Investor is allowed to transfer the leaseholdings of the built-up office spaces to individual businesses before and during construction of the MTB. In this model, the PPP Investor will have a 10 year Term from signing of Contract and will be allowed to transfer leaseholdings of the built-up space to individual businesses for long term leases. The businesses will pay a one-time Leasehold Transfer

amount to PPP Investor and will pay yearly service charges to the PPP Investor of the MTB, which will be PPP Investor during its 10 year term and afterwards will be BHTPA.

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA land for his business. Royalty payment will be in two forms:

- Upfront payment of Tk 500 million at signing of PPP Contract
- Yearly payment of 5% of Gross Revenue

Royalty payment amount to BHTPA will be much higher in this model than the Option C as the PPP Investor will be receiving large sums of money upfront by transferring the leaseholdings to individual customers.

Key financial indicators of the project Under Option E are presented in the following table:

Table 13: Key Financial Indicators under Option E

Output	
Equity IRR	**41.26%**
Project IRR	**41.26%**
Royalty Received by Government	
First 10 years (mil Tk)	**2,175**
Full Term of Contract (mil Tk)	**2,175**
Equity Payback Period (year)	**3**
Project Payback Period (year)	**3**

Financial analysis results of demand scenarios and investment options indicate that investment Option D and investment Option E is viable. However, Option E will be more attractive to PPP Investors compared to Option D.

Results also indicate that project will be financially viable if Resettlement Option IV or V is chosen. Resettlement options I, II or III are only viable if VGF is provided by Government or Option D is chosen as the investment model.

Economic Benefits

- It is expected that ICT Village will generate employment opportunities of 30,000 individuals through establishment of two Multi Tenant Buildings (MTBs).

- It is estimated that a total of 1,314 ICT units can be accommodated in total in the two MTBs at full capacity.
- It is estimated that under Option C Concession PPP Model (BOT), PPP investor will earn about **Tk. 180 billion** of revenue from the MTBs which include ICT offices, Banks, Food Court, Data Center and Conference Hall over a period of 30 years.
- In addition to the restoration and improvement of livelihoods, resettlement may provide opportunities to an affected community to improve housing, public infrastructure, and services and to engage in land use planning that contributes to the long-term development objectives of individuals and the community as a whole. The social resettlement project will provide the affected population with the opportunity to move from slum to economy housing with water, sewerage, gas, electricity, and paved access. These opportunities will be provided to inhabitants considering on chosen of any resettlement options from Option III: Off-site Resettlement by PPP Investor, Option IV: Off-site Resettlement by PPP Investor with Real Estate, Option V: On-site Resettlement by PPP Investor and Option VI: Resettlement of Entire Karail Area by PPP Investor.
- Implementation of social resettlement project will provide apartments to the inhabitants depending on preference of resettlement options. It is estimated that if one of the resettlement options (*Option III: Off-site Resettlement by PPP Investor, Option IV: Off-site Resettlement by PPP Investor with Real Estate, or Option V: On-site Resettlement by PPP Investor*) is chosen, each house owner will receive one flat. Therefore, the total no. of house owners (1,545) will receive **1,545** flats by selecting the above mentioned resettlement options.
- Under Model C: Concession PPP Model (BOT), it is estimated that BHTPA will receive royalty from the PPP investor in the amount of **Tk 356 million** in the first 10 years and **Tk 3,583 million** over the 30 year term.

  Under the Model D: PPP Concession Model with VGF, BHTPA will receive royalty from the PPP investor in the amount of of **Tk 356 million** in the first 10 years and **Tk. 13, 932 million** over the 30 year term.

  Under the Model E: Leasehold Transfer Model, BHTPA will receive royalty in the amount of **Tk. 2,175 million** in the first 10 years.
- Financial analysis shows that Government will receive approximately Tk. 46 billion as taxes from the project over a period of 30 years.
- Under Option C, BHTPA will handle the development of land and off-site infrastructure. BHTPA will also be responsible for social rehabilitation of inhabitants of the Karail area and handing over clear land to PPP Investor for development of Zone 1. It is estimated that at end of the concession

period of **30** years, the PPP investor will return the land and facilities to the BHTPA at a depreciated value.

- Under Option D, BHTPA will handle the development of land and off-site infrastructure and rehabilitation of inhabitants of the project site and the PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. The PPP Investor will generate revenue by leasing out space to tenants and will make royalty payments to BHTPA for the right to use the land. At the end of the concession period of **50 years**, the investor will return the land and facilities to the BHTPA at a depreciated value.
- Implementation of Social Resettlement Project Under option V: On-site Resettlement by PPP Investor, BHTPA will receive five thousand one hundred forty eight **(5,148)** flats worth residential asset value of **Tk. 9,502 million**. Additionally, BHTPA will also receive three hundred forty seven **(347**) shops worth commercial asset value of **Tk. 3,167 million.**
- It is estimated that BHTPA will earn Tk. **185 million** per year from renting flats and Tk. **49.97 million** per year from commercial spaces. Therefore, implementing social resettlement project will generate annual income of Tk. **235 million** per year for BHTPA.

Environmental and Social Analysis

ICT has environmental impacts through construction of buildings, the manufacturing, operation and disposal of devices and network equipment. However it also provides ways to mitigate the adverse effects and promotes efficient energy use, for example through smart energy saving buildings and well designed telephone activities. The ICT Village at Mohakhali may be labeled under Orange B category due to its environmental hazard during project construction phase, and Category B as per the World Bank Operational Policies. As such, the project requires an IEE for environmental clearance.

Though information technology i.e., computer use at all walks of life brings enormous benefit to the economy its adverse impact at operation level cannot be ignored. Its environmental impacts are often not realized or considered. These impacts are expressed throughout the manufacturing, use and disposal of computers, and thus require monitoring and an understanding of each stage of a computer's lifecycle. E-waste produced by ICT can have adverse effects on the environment, as well as human health, and therefore it is imperative to adapt appropriate measures to deal with this.

In a project of this magnitude and complexity there are some environmental impacts which could affect soil, and water quality, and which could cause hindrance (noise, dust, traffic) or pose safety hazards (health and safety). The

majority of these impacts is less significant and could be avoided, prevented or mitigated by contractors adopting good operational practices and environmental management guidelines and through permanent monitoring and inspection. Mostly all impacts could be prevented or mitigated by environmental management guidelines.

The positive impact during pre-construction phase includes public consultation and environmental sound design. Since the site is currently occupied by a portion of the Karail slum and its inhabitants, the major social challenge will involve the resettlement of this large community. During site preparation the Karail community has to be moved from the lands and resettled elsewhere, either on or off site. This is likely to have far reaching social and economic impacts, and must be handled delicately. Moreover, there are various legal issues involved that have added further complications to the resettlement process.

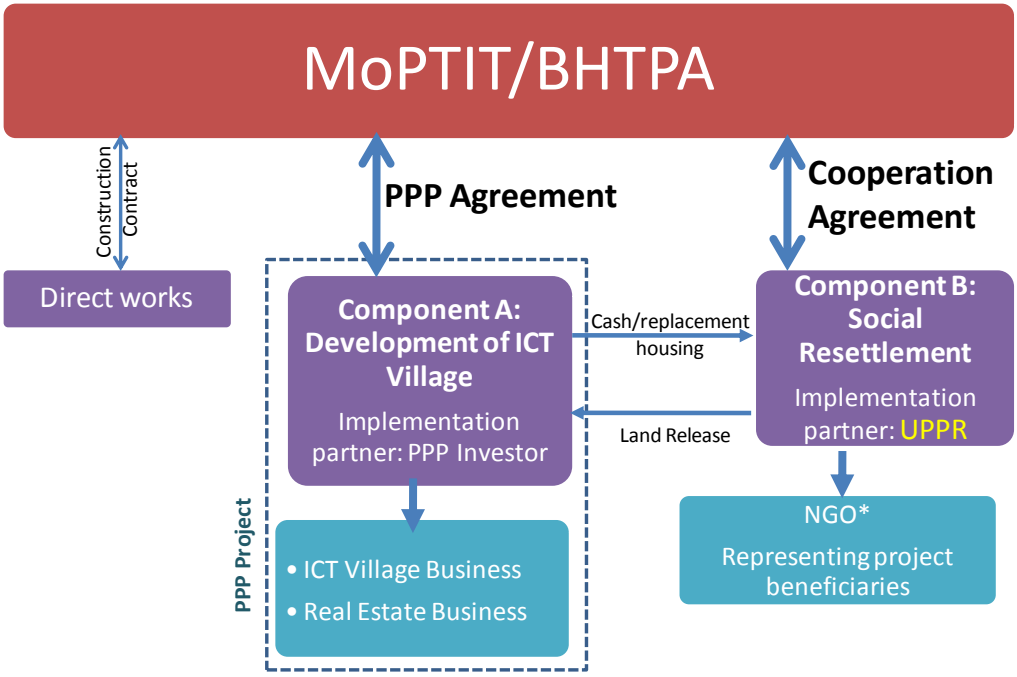
The proposed ICT Village will increase job opportunities, improve land value and demand for houses in the adjacent areas, create opportunities for businesses, improve infrastructure etc. The biggest challenge as mentioned before lies with the issue of resettlement, and this must be dealt with adequate care.

Project Implementation

Project implementation encompasses all activities that need to be undertaken in transforming the project from plans to physical reality. The social resettlement issues involved with this project present a challenge to the implementation process. Keeping this in mind, this project has to be seen in two components:

- **Component A: Developing ICT Village**
- **Component B: Social Resettlement**

The broad institutional setup showing inter-relationship between the institutions in carrying out the overall project including social resettlement, with the above broad components:



After the completion of the feasibility study (Phase 3), BHTPA will start preparation in two separate streams of activities: resettlement activities and transaction activities i.e. decide on a suitable resettlement option from the options described in Section 8, and engage UPPR or an appropriate institution for the role of social resettlement implementation partner and engage a transaction advisor. Under resettlement stream of activities, UPPR will carry out the preliminary activities of resettlement with separate funding, until the PPP investor is appointed. Under transaction stream, BHTPA will select a PPP Investor through a competitive bidding process, and enter into a PPP Agreement with them. Once the PPP Investor is engaged, he will interact with the UPPR and provide the funding/make housing in accordance with the resettlement option chosen.

It is necessary to clear the land before any construction starts, given the project site is completely inhabited by the Project affected households (PAHs). However, it would be quite difficult to evacuate all the affected households at the same time. In view of this, the UPPR will take decision in consultation with the BHTPA/PPP Investor on which households to be evacuated for clearing a certain area of the project site. As such, the Investor will prioritize the zones and designate the area of land within the project site. It is suggested to set out a comprehensive evacuation plan in the RAP.

Next Steps

For successful project implementation, it is important to have a Project Management Unit in place in BHTPA. The unit needs to be assigned with the responsibility of project implementation including all the critical issues

regarding this project. The management structure should involve a project team headed by a Project Director/Manager. The composition of the team may be changed time to time to meet the specific expertise needed during any phase of the project.

The appropriate model of inviting PPP Investor and the PPP Investor's scope of work that is suitable for the investors needs to be decided by BHTPA. A list of potential investors needs to be prepared, and the concept needs to be conveyed and consulted through a consultation paper in the Investor Promotion Meeting. In addition, steps need to be taken to start preparation of the Tender documents for procurement of a suitable PPP Investor for implementation of the project.

After submission of this feasibility report, following steps need to be taken:

1) *Form the Project Management Unit – MoPTIT/BHTPA*
2) *EngageSocial Resettlement Partner, UPPR – BHTPA*
3) *Prepare EIA – BHTPA*
4) *Prepare full RAP – UPPR*
5) *Consult PAPs Agree with PAPs – UPPR*
6) *Arrange and receive SCC – BHTPA*
7) *Engage Transaction Advisor – BHTPA*
8) *Approval of Major Terms and Conditions – BHTPA*
9) *Government decision on PPP Option and Model – MoPTIT/BHTPA*
10) *Prepare RFQ document – Consultant/ BHTPA*
11) *Identification of potential investors – Consultant/ BHTPA*
12) *Prepare RFP document – MoPTIT /BHTPA*
13) *Tendering and Evaluation – Consultant/ BHTPA*
14) *Negotiation and Contract Award – MoPTIT /BHTPA*

1

Background

1 BACKGROUND

The demand of IT/IT enabled services is increasing throughout the world and the investors around the world want to have a competitive cost of production. Bangladesh has a sizeable unemployed and educated young population with low labour cost of production which can be utilized in this sector with proper training and guidance. GOB needs to create skilled manpower through developing world-class business environment conducive for IT/ITeS to attract potential foreign and local entrepreneurs for investing in Bangladesh. There is also an advantage of Time zone. Bangladesh labour force can do the work ordered from Western countries overnight and have the job done before business hours begin the next day.

Bangladesh has one of the most attractive population demography in the world – relatively high young population base as over 34% are in age group of 15-34 years; which is favourable for IT-BPO industry. Analyst projections reveal that this number is further slated to go up. This corresponds to a young working population of over 53 million people – large enough to man the fledging IT/ITeS industry for years while keeping the costs low. For creating employment opportunity in the IT sector it was felt necessary to develop infrastructures which will create an environment for innovative companies and increase foreign & local investment.

In view of this, the Bangladesh Hi Tech Park Authority decided to create basic infrastructure for establishing IT Village in 47 acres land allocated at Mohakhali, Dhaka and to establish Software Technology Park (STP) in other 6 Divisions to develop world-class business environment conducive for IT/ITeS to attract potential foreign and local entrepreneurs for investing in Bangladesh. Establishment of an ICT Village in Mohakhali is a part of this project.

1.1 Digital Bangladesh and Government Initiatives In ICT Sector

(a) Digital Bangladesh

In recent years, there have been significant developments in the status of the ICT sector in Bangladesh. In particular, the promise of a 'Digital Bangladesh' is a prominent element of the platform maintained by the winning party in the elections of 2008. The vision of the present government "envisages that by 2021, Bangladesh will reach a trajectory of high-performing growth supported by advanced and innovative technology" and that "Information and communication technology will, by that time, take us to new heights of excellence giving the country a new identity to be branded as Digital Bangladesh" (SFYP 2011-16).

The main objective of establishing Digital Bangladesh is to innovate new means to deliver services of the government to the doorsteps of the common people by removing all the inefficiencies of the administrative systems. Government has a goal to ensure an economic growth of 10% by 2017 and rate of investment to increase to 38-40% from current average rate of 24-25% of GDP. In order to achieve this goal all government departments need to provide their services in utilizing the public resources ensuring speed, efficiency with effective administration. Therefore the concept of Information and Communication technology has been felt to be single most effective strategy for achieving the development targets of the country.

The Government's Digital Bangladesh by 2021 vision proposes to mainstream ICT as a pro poor tool to eradicate poverty, establish good governance, ensure social equity through quality education, health care and law enforcement for all, and prepare the people for climate change.

Government of Bangladesh has adopted Perspective Plan for 2010-2021 in which adequate emphasis has been given to develop ICT system to work as a driving force for the overall development of the national economy. Strengthening the information technology sector for the digital Bangladesh has been identified as an objective in the Perspective Plan.

In conformity with the objectives of “Digital Bangladesh” in the Perspective Plan, the government has pursued specific strategies within the Sixth Five Year Plan (2011-2015). The plan has put particular emphasis on the development of ICT and set strategic objectives to implement the Government's commitment. In this plan, the government and semi-government departments are expected to implement ICT systems and thus, re-engineer their business processes and become better integrated. The specific strategies mentioned in the Sixth Five Year Plan are as follows:

- Building sound and policy infrastructure: Creating appropriate dynamic legal and policy system to unleash potential for participation of citizens private sector, development agencies and government for creating new services.
- E-Administration: Business process reengineering for the government agencies for efficient and transparent decision making and accessing, for improvement of transparency of the government.
- E-Citizen Services: Converting traditional service delivery mechanism into e-service delivery system to bring “service at the door step of citizens”

Furthermore, the new ICT Policy has addressed the issue of creating an action plan to achieve the objectives of “Digital Bangladesh”. In particular, ICT Policy addresses the goal of transforming the nation into a middle income country by 2021. This policy emphasizes human resources development through

technology, connecting citizens, pro-poor services; ensure service delivery, and the creation of "e-administration" to ensure transparency. This policy also prioritizes e-services for Bangladeshi citizens, such as education, healthcare, agriculture, land & water resources, social safety nets and ICT based disaster management systems.

With the appropriate digital education, it is expected that E-businesses will utilize the maximum potential of ICT. Businesses of all sizes can utilize ICT for production, and access to markets, both domestic and international. Businesses will be able to conduct transactions and make payments online, internally and globally.

Adequate policies have been created to enhance efficiency and transparency in ensuring good governance. This process involves ICT systems with respect to effective parliamentary process, strengthening public services, ensuring justice for the poor, preparing ICT skilled law enforcing agencies, combating corruption, ensuring human rights and removing weaknesses from the implementation of public funded projects. The policy also emphasizes the need for implementing ICT based PPP model projects.

There have also been demonstrated successes in the creation and deployment of e-services. In order to make the Parliament more effective, government has established a system to determine the order of the question through digital ballot. As a result every Honorable member gets an opportunity to raise his/her question sequentially. A media centre has been established at the parliament to disseminate information regarding parliamentary activities. These developments set the stage for holistic planning and thus improving the quality and efficiency of e-services.

In the mean time e-service centres has been established in 64 districts, legal framework has been formulated to promote e-commerce including e-payment and mobile banking. To maintain security of e-payment and e-commerce 6 certifying authorities are licensed and 3 of them started digital signature certification program. For enabling Digital Bangladesh present Submarine cable bandwidth has been upgraded from 44.6 Gbps to 200 Gbps and the second submarine cable is under active consideration of the government.

Initiatives in the ICT Sector

In year 1993-1994, Bangladesh Railway implemented the first e-Governance project in the country with respect to its reservation and ticketing system in the ICT sector. Since then, a few other e-Government projects have been initiated in Bangladesh. This includes the e-birth registration of Rajshahi City Corporation in 2001, GIS mapping of all schools by BANBEIS and SICT project under Planning Commission (2002-2007). This last initiative, the SICT Project

involved the construction of the website and automation of 54 Ministries/Divisions (out of which 38 projects were completed). Many of the completed projects in SICT did not achieve the desired goals mainly because the selected projects applied a top down approach, ignoring the inherent demands of the stakeholders.

In December 2003, WSIS in its meeting decided to build the "Information Society" emphasizing to create a people centred development oriented information society and in doing so, detailed specific e-Government initiatives were required to meet the goal of MDG and PRSP in all developing countries. In response to the convention, many initiatives have been included within the Five Year Plans formulated by the government of Bangladesh. Subsequently the present government laid the foundation for an enabling environment with the ICT Policy 2009, ICT Act 2009 and Right to Information Act 2009.

ICT Policy

The Government of Bangladesh approved the first National ICT policy in 2002. This policy, however, was poorly implemented and thus the government failed to achieve the goals set in the policy. In response to this, the ICT policy was revised in 2009 and the revised ICT Policy 2009 promises to serve as a strategic action plan in line with the proposed "Digital Bangladesh".

The primary objective of the revised ICT Policy is to address issues related to (1) social equity, (2) productivity, (3) integrity, (4) education and research, (5) employment generation, (6) strengthening exports, (7) health care, (8) universal access, (9) environment, and provide (10) support to ICTs.

The Policy of 2009 includes various action items and the required time frame for realizing the goal of national economic development. This policy, amongst others, addresses issues related to social equity in accordance with the constitution of the People's Republic of Bangladesh. It does so within a framework optimizing the effective utilization of the nation's limited natural and abundant human resources.

This policy also emphasizes the need for implementing PPP model projects for the delivery of citizen services at lower cost and at greater transparency and accountability. The national ICT Policy 2009 has clearly indicated the development goals required in every sector of the Bangladesh's economy.

The ICT policy document is structured according to a hierarchical pyramid with a single vision, 10 broad objectives, 56 strategic themes and 306 action items. The vision and objectives are aligned with general national goals; strategic themes are areas within the broad objectives that can readily

benefit from the use of ICT. The action items, depending on the nature of work are to be implemented in the:

- Short term (18 months or less)
- Medium term (5 years or less) or
- Long term (10 years or less)

According to the present ICT Policy 2009, the Minister of MOICT is responsible for the coordination and monitoring of ICT policy, while the Bangladesh Computer Council (BCC) will assist in implementing action plans. Furthermore, all Ministries/Divisions and other public organizations will implement their ICT related programs independently. In case of any change in the program, however, the existing situation will be reviewed by government agencies and further actions will be coordinated.

Taking into consideration various issues related to ICT policy, the Government of Bangladesh emphasizes the need for connectivity, coordination among stakeholders, the development of human resources, software marketing, and other associated issues.

(a) Institutional Reforms: Creation of Digital Bangladesh Secretariat

In order to implement "Digital Bangladesh" the Government of Bangladesh felt the need for institutional reforms in addition to the strategies included in the Sixth Five Year Plan (2011-2015). According to the Sixth Five year Plan, the current e-governance cell at the Prime Ministers' Office will be upgraded to Digital Bangladesh Secretariat (DBS) to facilitate activities required to ensure the establishment of Digital Bangladesh. The Bangladesh Computer Council, moreover, will be strengthened and empowered with skilled and trained manpower to support the establishment of "Digital Bangladesh" and hence provide support to infrastructure development, technical assistance and capacity building for various e-government initiatives.

Single Point for ICT Infrastructure

The Government of Bangladesh has decided that the development of a strong ICT Division is crucial to institutional reform. As per the Sixth Five Year Plan, the MOICT is the key entity in ensuring a robust ICT infrastructure required to meet the objectives of the ICT Policy. In this context, a strong coordination between Ministry of Post and Telecommunication, S&T Division, and the Ministry of Information has been emphasized. At present, BCC, and Hi-Tech Park Authority operate under the MOICT. The Government of Bangladesh is also considering placing BTRC under the MOICT for better coordination of the e-governance system.

ICT Infrastructure

A competitive ICT infrastructure is an essential condition for the IT/ITeS activities. Particularly important is the broadband infrastructure, allowing for sufficient connectivity and Internet access at internationally competitive prices. Programmers need computers and access to the Internet. Good network capability is becoming indispensable as applications move to the cloud and for participating in global software activities. Infrastructure is also essential for the development of local software markets by linking applications and content with users through national backbone networks. In view of the rapidly increasing importance of mobile technologies and applications mobile broadband is also a key infrastructure element. Present infrastructural services for the ICT sector in Bangladesh is given below:

Software development requires some degree of knowledge imparted through the formal education systems or by specialized training institutions. The availability of an educated workforce and students enrolled in computer-related education fundamentally affects the potential of the system. It is important for programmers to have a solid knowledge of coding, but they also need to be able to understand requirements and specificities of the domain for which the software is adapted and developed. Partly for this reason, it is important to develop local capabilities that have an understanding of the specific context in which the software is produced. In view of the rapid pace of change in the software field, firms are often searching for programmers with the ability to learn new skills on the job. Such skills go beyond the pure technical aspects and concern also project management and other general business skills. The size and capabilities of a country's human resources are a function of three determinants – the education system (notably universities), the system for professional, industry-based education and training, and in-house training organized by software enterprises themselves

i) Broadband

Broadband services provide essential platforms for the development of knowledge based local, national, regional and global economies. Broadband is transforming the people's way of communicating, doing business and accessing information. It is a means to improve the efficiency, availability and reach of public and private sector services in areas of health, education and other government services and have important demonstrative effects in the socio economic sectors.

In March 2009, the Government of Bangladesh approved a Broadband Policy. Under this policy, the government ensures internet connectivity to optimize the use of information and communication technology. The government also

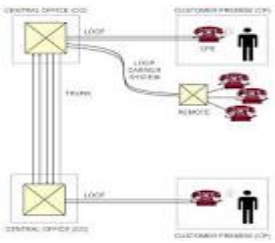
has a plan to extend telephone and internet connectivity at reduced charges to disadvantaged communities in Bangladesh. Besides this, the Broadband Policy also emphasizes affordable and advanced broadband services to create an enabling environment for investment in content development and the use of open source software.

To increase connectivity to the information highway, there is an initiative in place to connect Bangladesh with the Second Submarine Cable Network and thus reduces broadband costs considerably.

ii) National Connectivity

The state owned telecommunications company BTCL has the largest network in the country. It has multiple licenses from BTRC, which include (a) PSTN, (b) NTTN, (c) IGW, (d) ICX, (e) IIG and (f) ISP. These allow it to provide wide array of telecommunication services throughout the country, specifically voice and data. Recently the government has issued Nationwide Telecommunications Transmission Network (NTTN) license to two private companies along with the BTCL. Fiber @ Home and Summit Communications Limited are the only private operators with NTTN license. It allows them to develop and operate a nationwide optical fibre based transmission backbone facilitating a common connectivity platform. Both the operators have connectivity with the International Internet Gateways (IIGs). The sole business of the NTTN license holders is to carry voice, data, and videos of Access Network Service (ANS) operators and public agencies. The big ANS operators of Bangladesh are mobile phone companies. The other ANS operators are ISP, BWA, IIG, IGW, ICX, ITC, Cable TV operators and government entities.

Public Switched Telephone Network (PSTN)



The Government of Bangladesh has deregulated the telecommunication industry. The private sector is now authorized to enter the Public Switched Telephone Network (PSTN) communication business. At present, eight PSTN operators (including one public) are in operation. The total number of PSTN subscriber has reached 0.10 cr by March 2013 (Source BTRC). Present Teledensity is 64.6% (Budget Speech, 2013). The list of PSTN operators along with their subscribers up to May, 2010 is shown below:

Table 1.1: PSTN Operators and their Subscribers up to May, 2010

	Name of the Operators	Number of Subscribers (in thousands)
1.	BTCL	872
2.	Telebarta	56

	Name of the Operators	Number of Subscribers (in thousands)
3.	Jalalabad Telecom	11
4.	Onetel Communication	40
5.	Westec Ltd	17
6.	Shena Phone	12
7.	S A Telecom	18
8.	Bangla Phone	2
	Total	**1028**

Source: *BTRC*

Exchange of information across the world is done through International gateway (IGW), Interconnection Exchange (ICX) and International Internet Gateway (IIG) providing companies. The companies mentioned above have been given license by BTRC to operate these international gateways and interconnection exchanges.

Mobile Phone

The mobile phone has revolutionized the Telecommunication Industry in Bangladesh. Six mobile phone companies (including one public) are currently in operation. Multinational mobile phone companies are providing private sector telecommunication infrastructure in Bangladesh. The present number of mobile phone subscriber as of March 2013, is 9.99 cr and internet user is 3.4 cr (Source BTRC). The internet density has been increased to 19.9% (Budget Speech 2013).

The consumer mobile phone charges have been decreased drastically in recent years, primarily because of competition between the mobile phone companies.

Internet Access

The internet arrived in Bangladesh in early 1993. In June 1996, the Government of Bangladesh decided to allow private entrepreneurs to act as ISP (Internet Service Provider) using VSATS (Very small Aperture Terminal). Licenses have been given to 405 companies for operating as Internet Service Provider (ISP) by BTRC. The majority of ISP's are based in Dhaka; these ISP's lease bandwidth from BTRC and cater to various organization as well as provide single user connections.

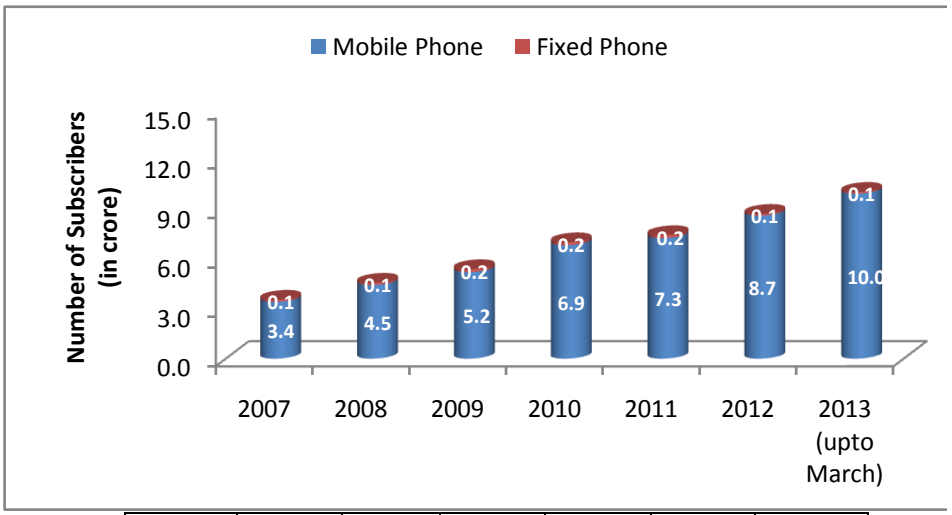
The Internet connections have been provided in 478 Upazilas through digital exchange. The number of internet users in Bangladesh increased dramatically from 1.0 lack in 2002 to 3.65 crore in March 2013 (Source: BTRC). Internet density has now been reached at 19.9% (Budget Speech 2013).In addition, the internet bandwidth cost has also declined significantly, from Tk. 24,000/Mbps in 2007, to Tk. 4500/Mbps in 2013 (Budget Speech 2013). At present per minute call charge is 30 paisa and 65 paisa in case of other operators all over the country and the minimum charge of broadband internet service (ADSL) has been fixed to Tk. 300.00 per month. The Government of Bangladesh is considering further reductions in prices, in line with neighbouring countries. The internet services provided by different category are shown below:

Category	Subscribers (in millions)
Mobile Internet	35.12
ISP and PSTN	1.23
WIMAX	0.32
Total	**36.67**

Source: BTRC (as of Oct '2013)

A comparative position of subscribers of Mobile phone and Fixed Phone with Teledensity over the last seven years from 2007 to 2013 is shown below:

Figure 1.1: Mobile & Fixed Phone Subscribers with Teledensity



Teledensity (%)	24.7	27.9	32.0	38.1	44.6	60.9	64.6

With the purpose of realizing the vision of "Digital Bangladesh", the Government of Bangladesh has emphasized the need to extend ICT facilities to rural areas in Bangladesh. Furthermore, the government has created a plan to extend low cost internet access to educational institutions and thus extend opportunities to students. In the mean time 1,450 KM of optical fibre

network has been installed. Some of the Mobile companies have already started 3G network technology in the market.

iii) Regional Connectivity

A key priority of the Government of Bangladesh is to enable communication between Bangladesh and regional countries. Bangladesh along with India, Nepal and Bhutan has agreed to collaborate on a mega sub-regional Information Communication Technology (ICT) project aimed at improving connectivity, reducing the cost of business and expediting the economic growth of those countries. The South Asian Sub regional Economic Cooperation (SASEC) was established in 2001 by Bangladesh, Bhutan, India and Nepal with Asian Development Bank's support. It aims to promote the sub-region's economic cooperation in priority areas such as, transport, tourism and ICT. The SASEC Information Highway Project will help SASEC countries connect with each other more efficiently and effectively through broadband. In March 2009, the Government of Bangladesh signed an agreement with ADB (Asian Development Bank) to develop network infrastructure with Nepal, Bhutan India and Bangladesh for developing the regional network.

This, in turn, will bring much needed benefits to communities in South Asia, especially to underserved rural areas. The deployment of ICT networks under this program can increase the benefits of e-health, e-education, e-agriculture, e-trade, etc to rural communities within Bangladesh and hence, harness the potential of ICT.

iv) Cross-border Connectivity with India

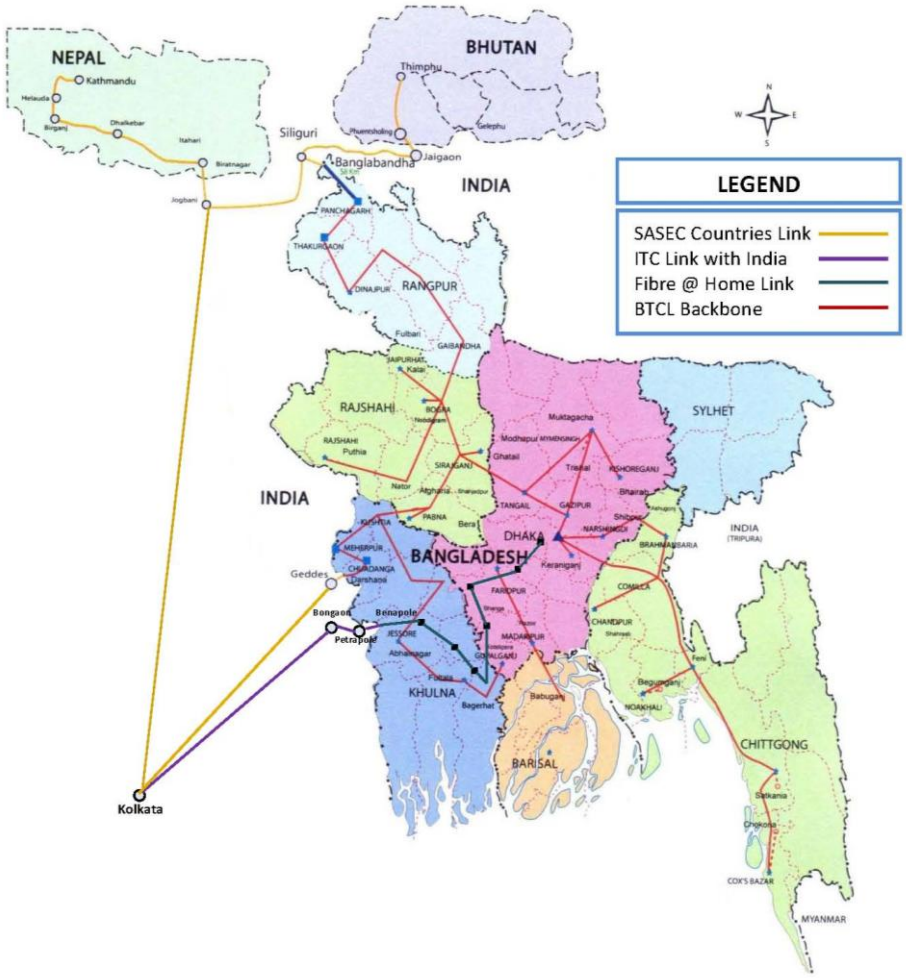
Although Bangladesh is mainly connected with the global telecommunication carrier through submarine cable network (SEA-ME-WE-4), it has international information highway through cross-border optical fibre network with India to get connected with the rest of the world. This alternate route provides redundant transmission network in connecting with international backbone in a more cost efficient way. It has been connected with India through two International Terrestrial Cable (ITC) points at Benapole and Chuadangah. Recently, the government has issued ITC licenses to six private operators along with the state-owned telco BTCL. In the Indian side, there are three operators connected with this network. The BTCL is directly linked with the Indian state-owned telco BSNL at Darshana in Chuadanga and the link was stretched out through Geddes to Kolkata. On the other hand, all the private ITC operators are connected with either Indian telecom giant Bharti Airtel or Tata communications. Both the Indian operators extend their link from Kolkata to Petrapole through Bongaon.

Table 1.2: Cross-border Connectivity with Indian Operators

India	Connecting Path	Bangladesh
State-owned Telcos		
BSNL	Kolkata – Geddes- Darshana	BTCL
Private ITC Operators		
Bharti Airtel	Kolkata – Bongaon – Petrapole – Benapole	Fibre @Home Limited
		Summit Communications Ltd
		Mango Teleservices Ltd
Tata Communications		Novocom Limited
		BD Link Communication Ltd
		1Asia Communication (*BD*) Ltd

All the Indian operators have upstream connectivity with different submarine cable with landing stations in the four port cities of Chennai, Mumbai, Cochin and Tuticorin. Bangladesh is primarily connected to India and the rest of the world through the 18,800 km long Sea-Me-We 4 (SMW4) submarine cable located in Cox's Bazar.

Figure 1.2: Cross-border Connectivity with Neighbouring Countries



This cross-border connectivity will not only enhance the voice and data connectivity between the two countries, in the long run it will also improve internet transit traffic between Bangladesh and the rest of the world. The cable will offer seamless connectivity to enterprise and carrier customers for transiting traffic between Bangladesh and key business hubs like Singapore, London, Chennai, Mumbai & Los Angeles via India. The cable is further interconnected with the fibre backbone constructed by NTTN operators in the country.

v) International Connectivity:

Bangladesh is connected with the information super highway through the submarine cable network SEA-ME-WE-4 in 2006. This provides Bangladesh with internet bandwidth of 24 GBPS establishing national high speed backbone which has been augmented to 142 GBPS in 2011 (BTRC). Currently all the major cities within the

country are connected through high speed fibre optic backbone. Almost all parts of the country are accessible through Internet consistent link for phone, Fax, Mobile and high speed satellite link for the data communication. GOB is continuously reviewing the cost of internet connection and reducing where necessary. The process connecting the Bangladesh with second submarine cable will be completed by 2014. High-speed Internet connectivity through fibre optic cables costs about USD 2.67/per month for 1 kbps connection.

(b) Promotional Activities

i) Public Private Partnership (PPP) Model Projects

The automation of Bangladesh Railway's Reservation and Ticketing System was the very first ICT based PPP model implemented in Bangladesh. Bangladesh Railway awarded this project, on a BOT basis, to Technohaven. Technohaven built the system and Bangladesh Railway has introduced e-ticket since 29th May, 2012. Now anyone can easily buy ticket from website www.esheba.cnsbd.com sitting anywhere either at home or office by using visa card, credit card or debit card. Till January 2013 above 5 lakhs ticket has been sold in online. As a result Bangladesh Railway's inter-city passenger revenue has been increased from BDT 480 million to BDT 1.10 billion while reducing ticketing staff from 400 to less than 200. The resulting productivity gain exceeded 200%. It also reduced cost and harassment of the passengers. The infrastructure is built by the operators.

ii) The Chittagong Custom House Automation Project:

Chittagong Customs House Automation project is another successful PPP model project implemented in Bangladesh. DataSoft implemented the project and it was launched in October 2008. This project was implemented in coordination with Chittagong Chamber of Commerce & Industry (CCCI), Chittagong Customs House and DataSoft. This project, which did not require any public sector investment, was developed to increase revenue and decrease irregularities through automation. As a consequence of this automation, the 42 steps lengthy process previously used by Chittagong Customs House has been decreased to only 5. Moreover, the bill of entry cost has been reduced from BDT 180 to BDT 50 only. The introduction of full automation and user-friendly procedures helped Chittagong Customs House reduce customs evasion by at least BDT 3.5 billion and double revenue earnings, which now stands at BDT 150+ billion a year. Also, this project has reduced the cost of doing business by at least 70%, saving custom processing time by 80%, and has helped establish a transparent level playing field for businesses (UNDP Report 2011).

iii) Union Information Centre (UIC):

The Union Information Centre (UIC) is a PPP model project implemented by Local Government Division (LGD) of the Ministry of Local Government, and Rural Development and Cooperatives. Under this project, approximately 4,501 Union Information Centres have been established to provide useful information directly to Bangladeshi citizens. This project, supported by the Access to Information (A2I) program was undertaken by the Prime Minister's Office.

The UIC's are normally located at the Union Parishad premises, and run by local entrepreneurs and various service providers in the private sector. Local entrepreneurs manage the UICs, while Union Parishads (UPs) ensure social security of the centre, LGD helps in capacity building and mobilization, and A2I provides the technical support and digital content. The entire management of the UISC is run by a committee headed by the UP chairman. Teachers, doctors, farmers, students, women, government and non-government field workers and UP members have also been included in the committee.

UISCs began its operations in 2009 in 30 Union Parishads (UP) through partnership between Local Government Division and A2I programme. The Quick Win initiative expanded rapidly culminating in a launch in all 4,501 UPs of the country on November 11, 2010 by the hon'ble Prime Minister of Bangladesh and UNDP Administrator.

Each UISC is operated by two young local entrepreneurs - a male and a female – under supervision of a local advisory headed by UP Chairman. The UP provides space and utility for the centre. Local Government Division coordinates with Cabinet Division and Bangladesh Computer Council to establish the basic ICT setup including computers, laptops, printers, multimedia projector, digital camera, webcam and solar panel. The entrepreneurs are free to install additional facilities to support business growth, at the same time, ensuring that the social sustainability of the centre is achieved by delivering government information and services including Public exam results, Government forms download, Birth and death registration, Online university admission, Population census data, VGD/VGF card database, Livelihood information. Employment information, Indian Visa Application, Visa processing /visa form printing, E-mail and Internet browsing, Computer Training, Video conferencing, Mobile Banking British Council's English Learning, Photocopying/Scanning.

As a consequence, people from Union Parishad can get free information on various government services, rules and regulations, passport forms, driving licenses, and much more from the UIC's. Moreover, unemployed individuals can access information about job vacancies; students can browse the internet while women can learn about their rights with respect to marriage and obtain information about maternal health.

iv) Software for Local Farmers:

Katalyst an NGO, partnered with the Soil Resource Development Institute (SRDI), an agency under the Ministry of Agriculture, developed an ICT-based service that has improved the access of farmers to assist how to use fertilizers in different locations and for different crops. Knowledge of the precise dosage of fertilizer is important and highly demanded as it influences the cost of input and the yield. Katalyst formed a coalition with Grameen phone and Banglalink, two mobile network operators in the country, to develop a mobile-based fertilizer information service. A local IT company, e-Generation, was asked to develop the required software application in Bangla, reflecting the local context and the specific needs of the local farmers. The new service was launched in July 2009 and has since shown positive results. Users have experienced two main benefits: reduced costs for using fertilizers (in some cases up to 25 per cent) and higher crop yields (in some cases as much as 15 per cent).

Based on the success of the software, Katalyst has developed similar software and service to address irrigation-related information needs of farmers. It helped to keep costs down and to adapt the service to the local users' needs and capabilities. For example, the user interface is completely in the Bangla language, the data used as input were provided by the SRDI and the software is hosted on the server of a local company. The software is owned by the Government, which has decided to integrate the new service in its Agriculture Information and Communication Centres and Union Information and Service Centres. The experience underscores the value of using public–private partnerships to develop software projects. It also demonstrates the importance of having access to local expertise to develop tailored solutions at low cost.

v) Other E-services

District e-Service:

The District e-Service Centre (DESC) started its operation in 14th November, 2011. The DESC is an ICT facilitated one-stop service centre which provides an efficient electronic version of the century-old manual and heavily bureaucratic service delivery system at

every DC office. It is located in the Deputy Commissioner's (DC) office. DESC has been designed to improve the accessibility and transparency of public service delivery system at the district level to achieve the following objectives:

- Ensure service delivery at the door steps of the people at the least possible time;
- Uphold citizens' Rights to Information through extensive information flow;
- Save time and labour in the processing period;
- Increase the number of clients served everyday through the use of ICT;
- Reduce corruption and increase accountability by ensuring enhanced flow of information and more transparent processes.

Services available at the DC office can be requested and received through the one stop service counters, online, by phone, by post, or by fax. The DESC was first piloted in Jessore DC office and is currently operational in all the 64 districts.

Citizens are now able to submit their applications online from service centres located at the DC office, UNO office, Union Parishad or even from their own home without having to travel to the district headquarters. Upon submitting their applications, citizens receive an SMS notification with a receipt number and date of service delivery. In addition, citizens will also be able to submit their applications through the District Portal from anywhere in the world including all the Union Information and Service Centres.

Citizens are notified through either SMS or email once the service is ready to be delivered. They can choose to receive the service in-person from the concerned DC office or by postal mail if the application is regarding request for any documents. During the waiting period, citizens are able to check the status of their lodged applications though SMS or District Portals. This has allowed citizens to avoid in-person visits to DC offices which were the practice previously.

ICT in Public Procurement:

Government has introduced e-GP (Electronic Government Procurement) systems to make the procurement system transparent, competitive and corruption free so that the genuine people can join the business with competitive price. The systems has been introduced for the Public Procurement under the CPTU, IMED, Ministry of Planning initially in four organizations i.e. LGED, R&H Directorate,

BWDB and Rural electrification board. Presently 12 organizations under 6 ministries and 350 government offices are running their tendering process through the e-GP portal system. 333 branches of Banks are receiving tender related fees and security money online through e-GP system throughout the country. Introduction of this system is a significant step towards building a Digital Bangladesh.

Once e-GP starts functioning in all the Ministries and Departments, one can submit tender documents from home, e-tendering makes it possible to perform automatic bid /proposal evaluation, contact management, e-payment and much more in easy and coordinated way and in lesser time. Besides, a large number of firms /persons are being able to participate in the bidding process, in effect; online tender submission will help getting rid of criminal offences like snatching away tender documents or unlawful influences. In addition, provision has been made for procurement compliance monitoring by using web based Procurement Management Information System (PROMIS), to check and monitor the submitted tenders comply with the public procurement rules and regulations properly.

Freelancers:

Freelance work is fast becoming a prominent feature in software development in Bangladesh. It offers a new potential source of employment for the growing number of IT graduates from different institutions. It also helps develop entrepreneurial skills since freelancers have to be proactive in marketing themselves. Freelancing is not an employment in itself but does represent one possible outlet for youth employment. Given that the work is typically done over the Internet, it also provides more location flexibility. However, for effective participation of freelancers, broadband Internet needs to be widely available, accessible and affordable. In Bangladesh, some 40,000 (BASIS) freelance programmers are reportedly earning around $15 million per year. It offers a new potential source of employment for the growing number of IT graduates in the country. It also helps develop entrepreneurial skills since freelancers have to be proactive in marketing themselves. There are no official data on the actual contribution of the freelancers in software development. However, a brief look at two platforms for on-line work – oDesk.com and Elance.com – may provide better information on this field.

Previously, the remittances for the freelancers were channelled through Western Union and taxed them accordingly. However, a directive issued in May 2011 by Bangladesh Bank recognizing that these funds should be treated as export-related commercial income, which is tax exempt. This is a significant development for freelancers.

ICT Incubators:

First ICT incubator in Bangladesh started its activities on 1st November, 2002 under the Ministry of Posts, Telecommunications and Information Technology with a government grant financing of Tk. 3.60 cr. The incubator is located at BSRS Bhaban, Kawran Bazar with a floor space of 68,563 sft in seven different floors. Bangladesh Association of Software and Information Services (BASIS) have been appointed as a Management Agent for the overall management of the incubator.

Software and IT Enabled Service companies are eligible to apply for space at the ICT Incubator. The tenants of ICT Incubator has been given the facility of paying office rent at lesser cost (Tk. 22.00 per square feet per month), stable power supply and free internet (2 Mbps bandwidth) connection.

Overall activities of the companies in incubator includes Developing Software ERP, Accounting & Inventory, POS, Phone Content, software etc., e-Commerce, e-Governance, Geographic Information System (GIS), Business Process Outsourcing (BPO), Data Entry & Processing, Website Development, Graphic Design, Animation and Multimedia.

At present 48 companies have been accommodated in this incubator and employment opportunities created for about 1700 IT professionals. These companies are exporting software in abroad to the extent of Tk. 380 million per year.

Call Centres:

Recently Government of Bangladesh has introduced Call centre business which has created new areas for revenue generation for the government. A call centre is a physical place where customer and other phone calls are handled by an organization, usually with some amount of computer automation. Typically, a call centre has the ability to handle a considerable volume of calls at the same time, to screen calls and forward those to someone qualified to handle them, and to log calls. Call centres are used by mail-order catalogue organizations, telemarketing companies, computer product help desks, banks and other large organization that uses the telephone to sell or service products and services. A call centre is operated by a company to administer incoming product support or information inquiries from consumers. Outgoing calls for telemarketing, clientele, and debt collection are also made. The centres may be used for both domestic and International requirements.

The cost of labour in the call centre is quite low compared to other neighbouring countries which are a great attraction for the outsourcer for call centre business in Bangladesh. Presently the cost of 2MBPS connection for a call centre is ranging from USD 900 to USD 5,000 per month depending on the size of the seats. Initial investment for a call centre of 30 seats is approximately Tk. 1.5 cr to Tk. 2.0 cr depending on the location and type of business.

Bangladesh has the location advantage because of the 11 hours time difference with the USA. For the time zone advantage American, West European and Asia Pacific's organizations can enjoy 24 hours customer service round the week. Our geographic location is also very suitable to establish a call centre. Because our environment is support us to work round the whole year. The geographical advantage and the time zone provide a great opportunity in the business competition.

BTRC has given licenses to 245 firms, including two International organizations for operating the call centre business. 72 of these call centres are in operation in Bangladesh now, employing around 20,000 professionals. (Budget speech 2013). From the interview with the President of Bangladesh Call Centre Outsourcing (BACCO), it is gathered that these companies are at present earning annual revenues of about Tk. 12.0 crore. This service is now one of the largest parts of the IT sector where approximately 63% of the IT professionals (WB Report) are working. According to President BACCO, the employment of the professionals in call centres is estimated to increase to 200,000 by 2021.

In domestic and International market, customer care through call centres is increasing rapidly. Because of the improved quality and professionalism, many of the organizations consider the use of call centres for improving their customer satisfaction and increase their business earning. With the technical

support from Agriculture Information Services (AIS) one of the private mobile operator started call centre services where experts advice callers on poultry, livestock, fisheries etc. In the agriculture sector there are many technological development like integrated crop management, improved nutrient balance integrated aquaculture techniques etc. Information on these can be disseminated through call centres. On-demand consultations based on call centre model can play a very important role to improve the capacity of those professionals working in the field and disseminate these complex techniques and skills more efficiently.

One US based outsourcer has expressed interest in setting up BPO operations with around 10,000 seats in Bangladesh with a proposed investment of USD 150 million.

In spite of all these activities there are few challenges of the call centres need to address which are as follows:

- Lack of uninterrupted broadband connections, telecom facilities
- Lack of redundant broadband connection
- Lack of professionals with English proficiency
- Lack of adequate Capital expenditures support

As a national priority, some of the countries like India and Pakistan have already started developing professionals with English proficiency for Call centres through education reform and capturing call centre business from abroad and creating large-scale employment opportunities for their economic growth.

Mass Media:

Access to information is an integral part of freedom of thinking, conscience and speech. Electronic mass media specially radio and television has a vital role in informing policies/programs and development plans of the government. Introduction of digital technologies in broadcasting has ensured increased involvement of the people in development activities through enhanced public awareness.

1.2 Broad Goal/ Vision of ICT Villages

The objective of the ICT Village project is to establish knowledge based industries throughout the country, particularly related to Software and IT Enabled Services, and thus contribute to the national economy and achieve the goals of Vision 2021: Digital Bangladesh. The Government of Bangladesh intends to create basic infrastructure for establishing an ICT Village in 47 acres land allocated at Karail Mouza, Mohakhali. This land will be used to develop a world-class business environment, conducive for IT/ITeS

industry. This ICT village will attract investments from both foreign and local entrepreneurs.

The specific objectives of the project are:

i. To promote balanced development of ICT Industries in Southern region of the country;
ii. To create basic infrastructure for the establishment of IT Park/STP in Sylhet;
iii. To construct a Multi Tenant Building (MTB) and other utilities services at the allocated land for creating ready infrastructure for the local and foreign investor;
iv. To create a conducive environment to attract foreign companies for establishing and operating Software and ITeS industry in Bangladesh;
v. To create employment opportunities for the ICT professionals;
vi. To promote knowledge based industry to realize the Vision 2021: Digital Bangladesh.

The proposed ICT villages when implemented will ensure the following facilities:

i. Single window service
ii. Strong customer base
iii. 24/7 technical support
iv. Qualified manpower
v. Competitive pricing
vi. Tie up with major telecom partners
vii. Service of International standards
viii. Inclusion of service for new entrepreneurs including the freelance workers.
ix. Strong and low cost internet connectivity
x. Office space for Software developer, call centres, Training centres, along with all recreational facilities for the user of the ICT Centre
xi. Low rent office space and
xii. Other physical facilities like nonstop/ stable power supply, water, gas, telephone, road/rail/Air linkage etc

1.3 Assignment Background

BHTPA intended to conduct feasibility studies for ICT Village at Mohakhali, Dhaka along with six sites at Jessore, Rajshahi, Khulna, Sylhet, Rangpur and Chittagong.

BHTPA issued a Request for Proposal (RFP) on 1 November 2012, for submitting technical and financial proposals for conducting feasibility studies for the development of ICT villages at the seven sites.

Infrastructure Investment Facilitation Company (IIFC), a government owned Consultancy Company under Economic Relations Division (ERD), Ministry of Finance, submitted Technical and Financial proposals on 2 December 2012 expressing its interest in conducting the Feasibility Studies. BHTPA issued notification of award to IIFC in April 2013.

A Consulting Services Agreement was signed between Bangladesh Hi-Tech Park Authority and IIFC on 30 April 2013 to conduct feasibility studies on the selected sites at Mohakhali Jessore, Rajshahi, Khulna, Sylhet, Rangpur and Chittagong.

In accordance with the Consulting Services Agreement, IIFC has prepared the Feasibility Study for the Development of an ICT Village at Mohakhali as a part of its assignment.

1.4 Brief Scope of Work and Approach

Scope of work of the Consultant in preparing the Feasibility Study for the development of an ICT Village at Mohakhali consists of two components i.e (a) Resettlement and rehabilitation of slum dwellers at the allotted land with a reasonable level of living standard and (b) Build an ICT village with international standard.

Government has around 94 acres of land provided to three government institution: Ministry of Posts, Telecommunications and Information Technology, Public Works Department and Bangladesh Telecommunication Company Limited at Mohakhali. The said land is not vacant: there are some unauthorized occupied slums. IIFC will have to conduct Feasibility study on land designated by BHTPA at the said site (i.e 47 acres). The study for the Mohakhali site will focus more on environmental and social issues. This is due to the fact that a number of significant decisions are needed.

Scope of work of the Consultants in preparing the Feasibility Study for the development of an ICT Village in Mohakhali was to review prior studies and other relevant documents including studies conducted by BRAC and other NGOs, examine the situation of ICT industries, conduct market survey amongst potential tenants of the ICT village, prepare demand forecast for the proposed ICT Village, explore modalities of private sector participation, prepare conceptual master plan and ICT building design and floor plans for the proposed ICT Village, conduct preliminary environmental analysis of the

site, analyze the social impact of the project and recommend mitigation approach and conduct financial analysis through financial modeling.

IIFC met BHTPA officials along with other related authorities for understanding the potential outlook of the project particularly on the preferences of the Client in terms of IT village layout and development model. IIFC consultants also reviewed various reports, data, maps and collected information for comparative information about international best practices in developing similar type of projects in other countries.

For conducting market survey and demand analysis, IIFC has taken an approach of timely delivery of outputs by quick engagement of in-house staff and outside consultants and effective mobilization of company resources. Specific attention has been paid to technical and commercial aspects. IIFC consultants met the relevant stakeholders, such as major local IT companies, free-lancing IT consultants, IT associations etc. and conducted IT industry survey and identified the types of industries that will be attracted to IT villages.

IIFC also analyzed the growth trends of the ICT sector, analyzed needs of ICT companies in the country, explored options of flourishing the growth of freelancers and ICT industry entrepreneurs through provision of adequate facilities at ICT Villages and reviewed the modalities for private sector participation in the operation of the proposed ICT Village in Mohakhali.

For obtaining information about the trends, practices and prospects of ICT industry, a market survey was conducted along with a consultative process with leading ICT entrepreneurs and scholars who are contributing significantly in flourishing the business in this sector. A market survey was conducted amongst targeted ICT companies in Dhaka to obtain their feedback in the development of an ICT Village in Mohakhali. An online survey was also conducted amongst ICT freelancers in the country.

Besides, a consultation process was followed with key industry players such as BASIS, BACCO and UNDP about their perception and prediction about the ICT sector in the country, especially with regards to development of ICT villages at divisional levels and their potential for employment generation and ICT sector growth throughout the country.

Subsequently the consultants prepared the market demand forecast for the ICT Villages through market survey for assessment of the needs and also identified companies that may relocate or open subsidiaries in the proposed ICT Villages.

Consultant also prepared a conceptual master plan and ICT buildings designs for the proposed ICT Village with consultation with BHTPA and MoICT. Based on the designs, project cost was estimated and used for financial analysis with Financial Model.

Based on the above, this feasibility report has been prepared with technical, commercial, financial, environmental and social analysis and a preliminary cost estimate for the project.

1.5 Background Works

Collection of proper information, reports and development of inhabitant's database is the initial approach for preparation of feasibility study of Mohakhali ICT Village. Therefore, IIFC team has carried out to collect background information, reports for moving forward the tasks and activities of feasibility study of Mohakhali ICT Village. The Background works are classified into two categories, Primary Sources and Secondary Sources.

1. **Primary Sources:** A number of Site visits to Karail slum, communicate with BHTPA time-to-time, and cooperation agreement indicate the primary sources of the data and information collection as background works that were carried out by IIFC consultants.

   i. **Visit to Karail slum:** As background work activities, IIFC conducted several site visits to understand current condition and status of Karail Basti.

Site Visit No. 1: The objectives of the site visit No. 1 dated 10 January 2014 were navigating the proposed site of 47 acres at Karail slum, Mohakhali and conducting a physical inspection of the proposed site includes the boundary demarcation, socio-economic conditions, living conditions, social infrastructure, Presence of NGO's and their activities, Gas connection, Electricity connection, water bodies and etc. The Report on Site Visit No. 1 is provided in *Appendix A.*

Site Visit No. 2: The objectives of the site visit No. 2 dated 20 January 2014 were:

a) Site walks within the project area and the neighbouring areas

b) Take photographs of significant aspects to assist in describing the baseline environmental conditions of the project area;

c) Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties;

d) Obtain relevant documents from the authorities such as local government, and key authorities within the project influence zone.

The aim of the site visits were to verify information and data collected during the research work and to collect more practical information that may have been important in the assessment of impacts and design of mitigation measures. On the basis of relevant collected data, identification of possible impacts has been conducted. This was followed by evaluation of likely impacts along with their origin and extensiveness.

Table 1.3: Site Visit Matrix at Karail slum

	Particulars	Date	IIFC Members	Objectives of site visit
1.	Karail Visit No. 1	10 January 2014	1. Nazrul Islam,Team Leader and Project Manager 2. Rabiul Islam, Infrastructure Advisor 3. Shariful Islam, Consultant 4. Maitrayee Roy, Consultant 5. Md. Hasanuzzaman, IT Assistant	To identify the boundary demarcation, socio-economic conditions, living conditions, social infrastructure, Presence of NGO's and their activities, Gas connection, Electricity connection, water bodies and etc.
2.	Karail Visit No. 2	20 January 2014	1. Shariful Islam, Consultant 2. Md. Hasanuzzaman, IT Assistant 3. Mohammad Mahbub Alam, Consultant 4. Sabeth Munrat, Project Officer (F/M)	To assess the existing environmental conditions of the project site and its adjacent areas in order to establish a baseline framework against which potential environmental impacts due to implementation of the project can be compared.

ii. **Communicate with BHTPA time-to-time:** Preparation of feasibility report require extensive communication with the major client, BHTPA. As because, BHTPA is an authorized and Govt. entity, they can access all channels where in consultants may find difficulties. IIFC team gathered relevant information of Karail Basti background from BHTPA. At the same time, consultants of IIFC kept informed to BHTPA for their tasks and activities by time-to-time communication.

iii. **Cooperation Agreement**: IIFC conducted a number of meetings with NGOs and donor agencies. They met several times with Urban Partnerships for Poverty **Reduction** (UPPR), funded by UK-Aid, managed by UNDP and executed by LGED.

From these meetings between IIFC and UPPR, UPPR provided their standard Cooperation Agreement and opined their value for partnership through this agreement to IIFC consultants. As per the requirement of UNDP and LGED, IIFC prepared a Draft Cooperation Agreement based on the standard agreement provided by UPPR in order to collect the existing reports, information especially a database of the inhabitants for

preparation of Feasibility Report. After the preparation of draft agreement, IIFC forwarded this agreement to MOICT, BHTPA and UPPR for getting authorization as way forward of the information sharing procedure activity for Mohakhali ICT village project.

2. **Secondary Sources:** IIFC consultants collected background information, relevant letters and correspondences on Karail slum from BHTPA. Besides this, they also met to a number of NGO's such as Center of Urban Studies (CUS), Dushtha Shasthya Kendra (DSK), BRAC Development Institution (BDI) etc. The consultants collected information on Digital Survey map, Preliminary Master Plan from BHTPA. All above activities are indicated as secondary sources carried out the background works by IIFC consultants.

i. Collected information, letters and correspondences from BHTPA: As Karail slum has long history since 1999; IIFC team members sent a formal letter dated 7 November 2013 to BHTPA to provide the relevant information, relevant letters and correspondences. Eventually, the team collected relevant documents to carry out the background works.

ii. Research Work: There are various NGOs and donor agencies who have already worked on Karail slum such as Center for Urban Studies (CUS), BRAC Development Institute (BDI), UNDP, etc. The proposed site at Karail Slum has sensitive issues regarding social rehabilitation aspects. Therefore, NGOs and donor agencies were unfriendly to disclose the relevant information. In this regard, IIFC team took the authorized letter from BHTPA dated 11 September 2013. The team collected the information from NGOs and Donor agencies through the authorization letter.

iii. Downloaded Documents on Karail Slum: IIFC team members downloaded a number of reports and articles to carry out the preparation of chronological history of background at Karail slum. The contents of the chronological history of background were the land ownership of the site, site transfership from MOSICT to MOICT, Slum development, Eviction of the Karail slum, Effects of livelihoods after the eviction, legal obligations and NGO activities for protection of slum eviction. A list of the downloaded reports and articles on Karail Slum is provided in *Appendix B.*

2

IT/ITeS Industry Analysis In Bangladesh

2 ICT INDUSTRY ANALYSIS IN BANGLADESH

ICT industries are fully dominated by the private sectors in Bangladesh while Public sector is just providing an enabling role in their development. In the private sector some of the apex bodies like (i) Bangladesh Association of Software & Information Services (BASIS), (ii) Bangladesh Computer Society (BCS), (iii) Bangladesh Association of Call centre Out sourcing (BACCO), (iv) Bangladesh Computer Samity (BCS), Bangladesh Computer Society (BCS) suppliers of computers and its accessories (iv) Internet Service Providers (ISP) and (v) Cyber Café Owners' Association of Bangladesh (CCOAB) are working for the improvement of the ICT industry in the country. A brief introduction about the activities of these organizations is given below:

i) Bangladesh Association of Software and Information Services (BASIS)

Bangladesh Association of Software and Information Services (BASIS) is the national trade body for Software & IT Enabled Service industry of Bangladesh. Established in 1997, the association has been working with a vision of developing vibrant software & IT service industry in the country. Members of BASIS account for the lion share of the total software & IT services revenue of the country. BASIS, through its regular programs and activities, works on the following broad objectives.

- Domestic market development by creating awareness among potential IT users from both private and public sectors, establishing market places for IT solutions and ensuring level playing field for local software and ITES service industry.
- International market development through networking and business linkage events as well as brand promotion of the industry at international level.
- Capacity building of the member companies as well as the industry as a whole through management/entrepreneurship development initiatives, technology training and resource sharing.
- Member service development and delivery in different operational and business support areas like financing, tax, export/import, remittance, foreign visit, contract and legal issues, IPR etc.
- Advocacy for business friendly and enabling government policies for the development of software and IT enabled service industry.
- Social contribution, as responsible citizen group, towards the long term national vision of becoming a technology driven knowledge economy, particularly through engaging with the young generation for motivating and guiding them for becoming future technology leaders.

BASIS has already gained modest success in attaining the above mentioned goals. For domestic market creation, BASIS has wide range of programs and activities. Every year BASIS organizes BASIS SOFTEXPO, the biggest software and ITeS exposition in the country.

There are over 1,000 software and IT enabled service (ITeS) companies (out of which 800 are registered and 200 are unregistered) in Bangladesh (BASIS). IT enabled services provide a wide range of areas, from media and entertainment, engineering, process and infrastructure, consumer services, banking, insurance, travel, manufacturing, pharmaceuticals, and financial services.

ITeS companies in Bangladesh are primarily involved in software development, data digitization and processing, call centres, animation, and multimedia and desktop publishing. A comprehensive list of IT enabled services is provided in Annex A.

ii) Bangladesh Computer Society (BCS)

Bangladesh Computer Society is working with the following aims and objectives:

a. The aim of the Society is to advance professional excellence in Information Technology(IT)
b. To promote, develop and monitor competence in the practice of IT by persons and organizations and to be the spokesman for IT professionals at international level
c. To develop knowledge and skill of IT professionals in developing, application and maintenance of IT and IT related appliance i.e. to promote continuing professional development and lifelong learning process.
d. To make data communication easy and to develop public opinion on it
e. To help develop IT skills of IT related persons and organizations
f. To maintain and promote the observance of standard of knowledge of IT for members of the Society
g. To define and promote the maintenance of standard of knowledge of IT for members
h. To promote the formulation of effective policies on information technology and related matters
i. To extend the knowledge and understanding of IT in the community
j. To promote the benefits of membership of the Society
k. To promote the benefits of employing members of the Society
l. To arrange seminars, workshops. symposiums, and lectures to improve the professional skills of members of the Society

m. To increase the use and application of IT for public welfare, spread of education and development of knowledge.

n. To arrange applied IT education

o. To maintain morality of members of the Society and to monitor and maintain level and standard of IT knowledge of members of the Society

p. To look after the welfare of the members of the Society

q. To create and enhance the opportunities and status of members of the Society in the work area

r. To create employment opportunities for the members of the Society

s. To promote human network

iii) Bangladesh Association of Call Centres outsourcing

The role of BACCO is to encourage creation of proper policies and regulations; ensure in place are fair and appropriate operating environment; and provide assistance to interested operators who want to enter the market. The role and objectives of BACCO are as follows:

1. To ensure fair and objective call centre policies and regulations are in place within the shortest period of time.
2. Advocate fair operating environment are in place from all government departments.
3. To promote Call Centre and BPO services globally.
4. Make Bangladesh a major competitive offshore contender for the MNCs.
5. To ensure good governance is established.
6. To open a new hi-tech sector in Bangladesh and thereby earn foreign currency.
7. Assist in generating new employment and human resource for the call centre market.

As of now there are about 245 call centres out of which about 72 are in operation.

iv) Bangladesh Computer Samity (BCS)

Bangladesh Computer Samity is the national association of the ICT companies (mostly focusing on the hardware segment) in Bangladesh. BCS was established in 1987 with eleven members. BCS comprises distributors, dealers, resellers of computers and allied products and locally assembled computer vendors. The objectives of the samity are:

a) To unite and encourage all computer vendors to join in one platform for achieving their common interest

b) To unit and encourage cooperation amongst companies, firms and industries

c) To seek cooperation among all the members in the ICT business

d) To safeguard the interest of its members and their development

e) To boost/encourage, promote and diversify effective use of Computer in Bangladesh

f) To make representation to the Government and related bodies on behalf of BCS members with a view to reduce bottlenecks, grievances, anomalies and meeting legitimate demands

g) To discuss and promote legislative support and other measures connected to or having bearing on the business

In Bangladesh every year, on an average over 300,000 PCs are imported. There are about 10,000 vendors are involved in the computer business in the country. A large portion of those PCs are assembled locally (the local value addition is less than 15%). There is hardly any part of a PC that is manufactured locally.

Locally assembled and often unbranded machines dominate the pc/server market. However, most of the international giants (HP, IBM, and Dell etc.) are present in the market through their local agents. The cost of a PC or server in Bangladesh is in line with world market prices. A branded server with basic configuration costs about USD 6,000 whereas the 'unbranded' version costs about USD 2,000. The average workstation price is USD 700-900 for a brand PC and USD 400-600 for a clone PC. After sales support of the hardware is satisfactory. Most of the large organizations usually go for AMCs (Annual Maintenance Contract) with the vendors. The AMC is customizable in accordance to the client's need. Large organizations including financial institutes and Telecom companies also import a large number of servers for supporting their solutions and data centres. The structure of the PC/Server market is heavily controlled by the few importers where there are less than 10 large importers who import bulk of these items. The retail market, on the other hand, is very fragmented with thousands of small entrepreneurs with small retail outlets (these also work as maintenance set ups) all over the country (in Dhaka alone there are over 2,000 such outlets). There is a strong supply chain structure across importers and retailers. In last couple of years, there has been a significant growth in specific segments like laptops and notebooks as global prices of those items came down significantly.

v) Internet Service Provider (IPS)

The Internet Service Providers Association of Bangladesh was established in 1998. The general purpose of ISPAB is to improve business conditions of the Internet service providers operating in Bangladesh. It serves the common business interest of its members. Internet Service Providers are providing internet services to various types of clients including schools, colleges,

universities, public and private offices, private individuals etc throughout Bangladesh. As of now there are about 405 IPS companies who take the broadband lease line from the BTRC and rent it out to its various subscribers. ISP's outside Dhaka are mainly connected with VSAT. The operating License and other terms and conditions particularly the rent to the subscribers is determined by BTRC. Related works involved are:

- Promoting higher business standards Disseminating information
- Ensuring benefit for members (and their customers)
- Influencing the government for pragmatic policies
- Performing functions that are customary among trade associations

vi) Cyber Café Owners' Association of Bangladesh (CCOAB):

CCOAB is the trade association of the cyber café businesses at the national level. Established in 2003, the association safeguards the rights and interests of the members and helps the ICT in Bangladesh through combined strengths of the members. At present there are about 4,000 Cyber Cafe's are in operation out of which 1,000 are located in Dhaka. Most of the Cyber cafe's provide initial training to the beginners. There is lack of standardized training in these organizations although very few are well organized.

2.1 Economic Climate –Global and Local IT/ITeS Situation

2.1.1 Global IT/ITeS Situation

The IT/ITeS industry is one of the fastest growing industries in the world. The ITeS industry is very broad and even comprises the business process outsourcing (BPO) industry. World Bank in its report, "Leveraging ICT for Growth and competitiveness in Bangladesh: IT/ITeS Industry Development" 2009, highlights various issues related to the global development of IT/ITeS business and specifically, Bangladesh.

This report estimates the global investment in IT/ITeS industry over the next five years (2011-2016) to be in the range of US $475-800 billion. Furthermore, less than 15% of this investment is shared by developing countries. This presents opportunities for countries such as Bangladesh to grow its IT/ITeS industry. The report also mentioned that IT/ITeS growth will lead to large scale employment creation, especially for the youth in addition to direct economic benefits. Moreover, growth in the IT/ITeS industry will reduce gender inequality and help in Bangladesh's economic development. The World Bank report further analyzed the most suitable IT/ITeS industries for Bangladesh which include:

IT application services

- Traditional services
- System integration
- Application development and maintenance

- Consulting

IT engineering services

- Mechanical design and production
- Embedded software
- Plant engineering

2.1.2 Local IT/ITeS Situation

Development of software in the IT industry is one of the most important area of work in IT business. Today, it represents a critical component in the production of almost all goods and services. In cars, telecommunications, consumer electronics, medical devices and robotics it is embedded to provide the desired functionality. Companies aspiring to participate in international supply chains and to make their business profitable need access to competitive software solutions. The software in IT industry itself is an area that holds potential for continuous technological upgrading.

The overall turnover of the IT industry in Bangladesh is relatively small; approximately US $800 million (BASIS Survey 2012). There are about 800 registered IT Firms working in the market out of which about 160 companies export their software product to America, Europe and East Asian Countries. There are about 200 unregistered small and home based software and IT ventures doing business for both local and international markets (BASIS).

According to BASIS, the industry has employs about 70,000 skilled individuals including about 15,000 agents working in the call centres. Besides this, about 40,000 people work as freelancer. There are over 10,000 hardware vendors doing business in the country. The local industries are involved with less complex projects such as web content development, mobile content development, back office software development, 2D/3D animation, desktop publications and call centres. Bangladesh, however, possesses potential to move up the ladder for more complicated projects (ERP, CRM, ASP etc.) in the close future.

The cost of employing ICT skilled individuals in Bangladesh is, on average, 50% less than other countries such as India, Philippines, Malaysia, Thailand and Vietnam. (KPMG, 2012) The Government of Bangladesh provides cheaper bandwidth and plans to establish at least seven IT parks in various parts of Bangladesh. The country has favorable ICT Policy for the growth of the sector. At present, teledensity in Bangladesh is about 64.6% (as of March 2013). There are about 80 universities producing approximately 185,000 graduates per year out of which about 14,500 graduates are in IT related subjects. Moreover, all Upazilas are now under mobile network coverage.

Intellectual Property Rights (IPR) protection is a very sensitive issue for outsourcing work. Protecting intellectual property is to give incentives to

invest resources in bringing new products (open source and proprietary software) to market. Encouraging local firms to develop new solutions has the advantage of promoting indigenous innovation and its commercialization, as well as more sustainable employment. Vendors in Bangladesh have adopted strict security measures to prevent customers' intellectual property rights being violated. Further measures are being enforced through the new ICT Act, aimed at reducing piracy.

The Government of Bangladesh has a liberal taxation policy. Income generated by the IT/ITeS industry is tax exempted. Tax exemption includes digital content development and management, GIS development, IT support and software maintenance services, BPO, Data entry, graphic design, search engine optimization, web design, e commerce, online shopping, document conversion, imaging and archiving etc.

Bold and relevant initiatives can help Bangladesh become a viable player in the IT/ITeS industry (WB report). This includes identifying appropriate strategies, action programs and investments needed for the country to leverage ICT for economic growth and competitiveness. These policies can reduce gender inequality, increase youth employment, and hence lead to social development. In addition, the World Bank's current Country Assistance Strategy for Bangladesh recognizes the key role of ICT in supporting Bangladesh's growth, competitiveness and good governance agenda.

2.2 Bangladesh ICT Industry

The IT/ITeS industry is growing and is playing an increasingly prominent role in Bangladesh's economy. This industry serves both domestic and international markets. As mentioned earlier, there are over 800 registered software and ITeS companies in Bangladesh. There are a few hundred more small unregistered companies (BASIS).

The total size of the IT market excluding Telecommunication is approximately USD 800 million (BASIS 2012), the software industry takes up 44% (US $352 m) and ITeS is about 56% (448 m). Recently, there has been strong growth in freelancing, where young professionals directly serve overseas clients. These professionals mainly work from home and do not own registered companies. According to BASIS, there are about 40,000 freelance professionals in Bangladesh, earning on average revenue of about USD 15.0 million per year (BASIS).

BASIS carried out a survey on three hundred of its member companies in 2012. This survey sought to identify the business nature, volume and size of IT/ITeS companies. In excess of 70% of surveyed companies were found to be involved in development and maintenance of software for their clients. A number of these companies also engaged in providing different IT enabled services to their clients. In total, almost half of the surveyed companies were

involved in providing a range of IT enabled services (data/form processing, graphic/web design, content management etc.).

A large number of software and ITeS companies who provide non-specialized services cater to business demand across different client industries. Examples of such general IT solutions include accounting solutions, web site development, CRM, sales automation, office management, security solutions and etc.

The local software industry has been trying to keep pace with the most recent developments occurring across the technology and communication space. A number of companies are developing apps for mobile and other hand-held devises. A significant number of software and IT service enterprises (mainly the larger and more established IT companies) have developed expertise targeting the government/public sector market (KPMG, 2012).

A number of companies are developing apps for mobile and other hand held devices. Some companies are also providing services (platform or content development service) according to new and innovative business models like pay per use, utilizing the mobile distribution channel. A significant number of software and IT service enterprises have also developed expertise in the government /public sector market.

2.3 Industry Strengths and Needs

In general the strengths of IT/ITeS industries depend on the (i)availability of skilled manpower (ii) Competitive cost of doing business (iii) Quality of Public infrastructure and (iv) appropriate business environment.

Bangladesh has a good number of young educated unemployed populations, which can be the workforce of IT/ITeS Industries. In the education sector, Bangladesh has 84 universities including 23 public universities where IT related courses are offered in more than 60 universities.

There are degree and intermediate colleges where IT related programs are offered in more than 40 institutes. In addition, there are many Polytechnic institutes where IT related programs are offered. From all of these institutions approximately 14,500 students (BASIS estimate) are graduated every year out of approximately 5,000 software graduates. Initiatives are underway to introduce computer science at secondary school level. The numbers of IT graduates are small compare to demand in the market and therefore government has to address the issue by increasing the course facilities as well as number students to meet the situation. The curriculum for the IT courses in the educational institutions should be synchronized with the requirement of the IT industries.

Bangladesh based companies- both domestic and multinationals, have build strong relationships with various universities in the country to tap and train

talent at the sources. Finishing schools to bridge the skill gaps between academia and industry are also coming up, allowing ready resources availability.

Bangladesh has a much lower IT/ITeS labour cost compared to India, China and Pakistan. It is estimated that the IT/ITeS skilled labour cost is as much as 50% less in Bangladesh than its neighbouring countries (KPMG Report 2012). This is an important advantage since labour is the largest cost component across most IT/ITeS segments. Thus, this labour cost advantage together with a sizable young population can attract investors and grow the IT/ITeS industry in Bangladesh.

According to a DANIDA study (2006), a considerable brain drain and the attractiveness of other business sectors are reducing the number of professionals seeking an IT career. Moreover, the deteriorating quality of the IT/ITeS labour force could significantly affect the quality of industry output. Besides this, a lack of employment opportunities are leading to a declining number of students in IT programs which can reduce the labour force available to IT/ITeS.

Companies seeking to outsource primarily select the outsourcing agency factoring in the quality of service, language skills, cost of product, and the availability of skilled manpower in both the present and the future. In this aspect, Bangladesh has prepared quality workforce, train its manpower to comply with international standards and guidelines.

Bangladesh has a lack of CMMI certified individuals/firms while other countries continue to make progress in this area. Capability Maturity Model Integration (CMMI) certificate is most important for IT/ITeS firms and its employer's for outsourcing jobs. CMMI is a process improvement certification program. This certification is used to demonstrate the maturity of individuals and firms in improving processes, mainly through outsourcing. There are 50 companies in Bangladesh capable of reaching CMMI level 3 certification and another 10 capable of reaching CMM level 4/5 by 2014 (WB Report). While these goals seem plausible, Bangladesh is lagging behind significantly in implementing national level strategies and prioritizing support to individuals and companies seeking international certification. Bangladesh has to address these issues in order to gain a larger market share of the global IT/ITeS industry.

Some companies in Bangladesh have performed well in certain IT/ITeS segments. By replicating best practices, expanding on strengths and making use of low cost and abundant labour, Bangladesh can expand its market share of the IT/ITeS industry. In particular, Bangladesh has to increase awareness about the potential of the IT/ITeS industry, and the potential of Bangladesh's labour force. Bangladesh has to take advantage of talent across the country by expanding IT/ITeS businesses to cities, districts and divisions

outside of the capital region of Dhaka (WB Report 2010). Moreover Bangladesh needs to tap into its female labour force to facilitate growth in IT/ITeS. This can help Bangladesh increase its supply of talent, maintain its cost advantage and gain momentum in its pursuit of the IT/ITeS industry. World Bank report also recommended developing IT parks in various places of the country.

Bangladesh has a broadband policy and according to the policy the cost of connectivity is quite competitive compare to our neighbouring countries but unfortunately, the speed quality and reliability seems to be inadequate, power supply is unreliable and internet penetration is low particularly for the disadvantaged group. These issues are to be addressed to strengthen the IT industries. For doing competitive business in world market, proper business environment in the country is very much essential. This includes attractive fiscal policy, good governance, Law and order situation proper and timely judgment systems. Laws and regulations are to be reviewed regularly and inappropriate laws are to removed.

2.4 Business Trend

The local market is the predominant source of business for the software and IT service industry (63% of BASIS member companies are solely focused only in the local market). There has been a consistent growth, in the local market, of 20-30% over the last few years (WB Report). The market is also maturing in terms of both client requirement and solution response from IT companies.

Although there is a high level of interest in IT jobs in the public sector, the private sector dominates the IT/ITeS market. From a survey carried out on 110 IT solution companies catering mostly to the local market, it is found that a share of them provide business application solutions including ERP, accounting software, HR software, sales automation, inventory management system, and etc to private sector business enterprises.

Banking and other financial sectors (including capital market, Insurance, Leasing, MFI's) still continue to be the major focus for many IT companies. In the banking sector, the core banking software market is dominated by foreign software companies (though in a number of cases local solution companies are working for implementation and maintenance of this software). Interestingly, a good number of local IT solution providers are working with banks to provide a range of ancillary services related to banking. Because of the growth of the Bangladesh capital market in recent years, a number of companies have developed solutions for merchant banks, brokerage houses, and issue managers.

As regulation in the micro credit/micro finance institutions (MFI) become more stringent, and there is more pressure for operational efficiency, a number of MFI solution development companies are targeting this otherwise untapped market.

Moreover, the manufacturing sectors including RMG, textile, pharmaceuticals and other consumer goods industries have created sustainable demand for IT solutions like ERP, HR information systems and production and financial management solutions. On the other hand, service industries like telecom (second highest after financial sector within service sector), retail & wholesale, healthcare (hospitals, diagnostic centres etc.), education (university, schools and colleges), publishing/media and real estate have created sizable market space for IT solution companies.

The local software industry has been trying to keep pace with the most recent developments occurring across the technology and communication space. A number of companies are developing apps for mobile and other hand-held devices.

2.5 Growth Trend

The global IT/ITeS market continues to grow and due to its large market size, there is a huge potential for Bangladesh to grab additional market share. Several Bangladeshi Companies have been successful in penetrating the global IT/ITeS market. The Export trend in recent years is shown below.

Table 2.1: Export Trends in recent years

Fiscal Year	Export (in Million USD)	Growth(Over Last yr)
2006-07	26.08	-3.44%
2007-08	24.09	-4.8%
2008-09	32.91	32.59%
2009-10	35.36	7.44%
2010-11	45.31	28.14%
2011-12	75.81	56%
2012-13	101.63	43.53%

Source: *EPB & BASIS Report, 2013*

Major export destinations for software companies include the US, Japan, UK, Denmark, Sweden, Norway, Netherlands, Germany, Australia, Saudi Arabia, and the UAE. Most software exporting companies are primarily involved in development and maintenance of small and midsized web applications, games or mobile applications etc. The global growth rate in the IT/ITeS industries is 16% over last five years, reaching a size of 1.06 trillion dollars in 2010 (NASSCOM Review 2010). In comparison, the overall IT industries in Bangladesh have enjoyed a growth rate of 40% over the last five years (BASIS) and this trend is expected to continue.

2.6 Investment Trend

2.6.1 Investment Trend in ICT Sector

Investment in ICT sector is provided through Public sector, Foreign Direct investment and Private sources. Public sector investment is provided through Annual Development Programme (ADP). Foreign Direct Investment in ICT sector mainly covers on Telephone and Mobile industries while private sector investment were made through private Banks and Joint venture companies. Private sector investment in IT sector could not be obtained. However, the investment made in the last five years in the ICT sector from the public exchequer has been collected from the Revised ADP's of 2009 to 2013 and Original ADP of 2014. The public investment includes the allocations for ICT related projects under the Ministry of Posts, Telecommunications and Information Technology.

Table 2.2: Allocations in the ICT Sector under Revised Annual Development Programme (ADP)

(Tk. in Crore)

	Year	Total Allocation	GOB	Project Aid
1.	2009-10	464.70	358.00	106.70
2.	2010-11	381.89	288.43	93.46
3.	2011-12	1,821.40	350.99	1,470.41
4.	2012-13	1,202.83	262.71	940.12
5.	2013-14 (Original ADP)	14.56	5.24	9.32
	Total	**3,885.38**	**1,265.37**	**2,620.01**

An attempt was made to collect information on foreign direct investment in the mobile industries. Information obtained from the published financial statement (annual Reports) only from three companies for four years starting from 2009 to 2012. The information on the investment in the mobile industries is shown below:

Table 2.3: Net Cash used in Investing Activities

(Tk. in Crore)

Year	Grameen phone (Jan – Sep)	Banglalink (12 months)	Robi Telecom (12 months)
2009	1,253.57	1,502.50	1,629.45
2010	591.70	1,172.10	1,205.78
2011	577.67	4,236.10	86.24
2012	1,970.27	773.20	104.58

3

Institutional Arrangement

3 INSTITUTIONAL ARRANGEMENT

3.1 Role of Government In the ICT Sector

The government has two roles to play in regards to ICT, an active role in increasing readiness for electronic delivery and an enabling role in encouraging the private sector to deliver electronic services. Hence, Government need to create an organization to facilitate e-government, and enact policies that will incentivize private investment in infrastructure and application development.

In particular, Government policy can be used to create a liberal taxation environment to attract private sector investment. Other important policies include promoting good governance, maintaining law and order, and ensuring an effective judicial system.

The recent growth of information and communication technology has promoted social productivity, improved people's living standards, transformed people's mode of production and life-style and has helped create an “information society”. This change towards an information society is the outcome of human civilization and progress. Consequently, this information society should be a people-centred, development-oriented and inclusive society, which benefits each and every member of society. Keeping this in view, the government’s ‘Digital Bangladesh by 2021’ vision plans to mainstreams ICTs as a pro-poor tool to eradicate poverty, establish good governance, ensure social equity through quality education, healthcare and law enforcement, and prepare the country for climate change.

The government of Bangladesh emphasizes the need for a comprehensive Master Plan in order to achieve an overall development of the ICT sector. This Master Plan is being developed according to a framework based on Vision 2021 and ICT Policy 2009. At the centre of the proposed framework will be the National Information and Knowledge System (NIKS), a platform for developing and delivering services to citizens in both rural and urban areas. The five components of the ICT based economic development framework are:

- Connecting Citizens
- Human Resource Development
- Digital Government
- E parliament
- E business

GOB plans to address the above issues through the concerned ministries and with respect to a given timeframe mentioned in the ICT Policy.

3.2 Ministries /Agencies Involved With ICT Sector

The table below summarizes the roles of different government stakeholders along with the responsibilities of transforming the nation into a knowledge-based society.

Table 3.1: Summary of the Roles of Different Government Stakeholders

	Ministries/Division/ Agencies	Responsibilities
1.	Prime Minister's Office	• Policies and Guidelines of implementing Digital Bangladesh Program
2.	MOPTIT	• ICT Development Plans/programs • ICT Policy • ICT Related Laws • Facilitates computerization at Government Institutions and Schools • Attract foreign investment in ICT infrastructure • Digital Certification Interoperability Guidelines • Building and maintenance of Telecommunication Infrastructure
3.	Science and Technology Division	• Promote Science and Technology in the Society to nurture entrepreneurship in the society • Implementation of nuclear power and promote development of local technologies.
4.	Ministry of Law and Justice and Parliamentary Affairs	• IT Related Laws • Hi-Tech Park Act • ICT Act • Certifying Authority's Rule • Right to Information Act • Bangladesh Computer Council Act • BTRC Act • Bangladesh Telecommunication Act
5.	Planning Division	• Secretarial Support to ICT Task Force
6.	Ministry of Education	• Curriculum for IT Education • Computerization at schools • Education Policy

	Ministries/Division/ Agencies	Responsibilities
7.	Bangladesh Computer Council	• IT training in Government officials and citizens • Incubator for Software companies • IT Advisory support for Government institutions • Standardization on IT related issues
8.	Bangladesh Telecommunication Regulation Commission	• Regulations for Telecommunication system providers • Licensing Authority for IPS, Private telephone/Mobile operators, Call Centres etc • IP Telephony System • Vehicle Tracking Service • WIMAX Services • Fixing up the rates for different services • Third Generation (3G) Telephone • Submarine Cable System and Services
9.	Bangladesh High Tech Park Authority	• Development of IT Parks by public/private sector or by PPP model • Concessional agreement for PPP Model projects • Management rules/Regulations for efficient management of the parks
10.	Ministry of Information	• Right to Information Act
11.	Bangladesh Bank	• Regulation on Fund Transfer • Mobile Banking & Credit Card based transaction System • Automated Clearing House system • Bangladesh Payment and Settlement system regulations 2013
12.	Ministry of Commerce	• Intellectual Property Rights • PPP Model Projects

3.3 Regulatory Authority and Functions

There are eight Regulatory Authorities involved in enabling the development of ICT businesses:

i) Ministry of Posts, Telecommunications and Information Technology
ii) Bangladesh Computer Council
iii) Bangladesh Hi-Tech Park Authorities
iv) Ministry of Commerce
v) Ministry of Information
vi) Bangladesh Bank
vii) Bangladesh Telecommunication Regulatory Commission

A short description of the function of the above authorities is included below.

3.3.1 Ministry of Posts, Telecommunications and Information Technology

The ministry consists of two divisions — Posts and Telecommunications Division and Information and Communication Technology division.

- **Information & Communication Technology Division:**

The Information & Communication Technology Division is responsible for developing the ICT sector in the Country. Some of their responsibilities are:

(a) Formulate and update national policies on information and technology as well as provide assistance to the different Ministries/Divisions and Agencies regarding activities on information and communication technology;
(b) Implementation of recommendations of the National ICT Task Force;
(c) Provide grants and overall assistance to agencies in the information and communication technology sector including non-government ICT organizations/societies, undertake surveys, sampling, research and development in the information and communication technology sector and provide access to funding for such activities;
(d) Liaise with different countries and international organizations in the information and communication technology sector and also implement agreements and assistance programs in these relevant sectors;
(e) Assist in and co-ordinate the preparation of an integrated work-plan on service oriented activities relating to e-governance, e-infrastructure, e-health, e-commerce etc.
(f) Formulate policy and instructions for commercialization of ICT services in order to reach people easily

(g) To attract local and foreign investment in the ICT sector through all infrastructure development including establishing software Technology Park, hi-tech park and ICT incubator, improving the competitiveness of local companies and increasing employment and export.

(h) Secure and give legal status to electronic records, ensure and implement reservation of all data and identity of senders and receivers.

There are two relevant agencies that operate under ICT Division. These are BCC and Bangladesh Hi-Tech Park Authority (BHTPA).

- **Posts & Telecommunications Division:**

The primary function of the PTD is to provide a quick and modernized telecom and postal services to the people of Bangladesh and thereby facilitate the creation of a digital Bangladesh. These services are provided through Bangladesh Telecommunication Company Ltd (BTCL), Bangladesh Telecommunication Regulatory Commission (BTRC), Bangladesh Submarine Cable Company (BSCCL), Teletalk Bangladesh Ltd, Telephone Shilpo Sangtha (TSS) and Bangladesh Post Office (BPO). Each Agency is tasked with separate responsibilities.

3.3.2 Bangladesh Computer Council (BCC)

BCC is a statutory body under the Ministry of Information & Communication Technology, Government of Bangladesh for encouraging and providing support for ICT related activities in Bangladesh. It is established by Act No IX of 1990 passed by the Parliament. The function of the Council shall be:

(a) to encourage the use of Computer and Information Technology (CIT) for the socioeconomic development of the country;

(b) to formulate and implement national strategic policies and plans on CIT and help developing infrastructural facilities for the introduction of CIT in Bangladesh and promote professional efficiency in the field of computer education and training;

(c) to help build-up Bangladeshi nationals to compete in the growing CIT industry in the international market;

(d) to encourage in developing human resources in the field of CIT and organize manpower export in the international market;

(e) to formulate and implement national strategies and policies related to CIT;

(f) to collaborate and co-operate with the Government and other organization and advise them for attaining the national CIT objectives;

(g) to advise and encourage the Government and other organization in using Computers and Information Technology;

(h) to advise organizations concerned regarding security measures to be adopted for using CIT;

(i) to organize, equip and maintain Computer Training Institutes, Libraries and Laboratories for the overall development of CIT;

(j) to collect, analyze, and publicize information related to CIT;

(k) to collect, print and publish reports, periodicals, papers on CIT and related subjects;

(l) to organize workshops, seminars, training on subjects related to Computers and Information Technology;

(m) to give grants to initiate or conduct research, study, or training on subjects related to CIT;

(n) to collaborate and co-operate with the concerned Government organization, private sector organization, local and foreign bodies for attaining the national CIT objectives;

(o) subject to the approval of the government, to enter into any contract or agreement of any kind with foreign firms for the purposes of the Council;

(p) to discharge any other function assigned or delegated to it by the government from time to time;

(q) to develop specifications and standards for the CIT industry at a national level; and

(r) to do such other acts and things as may be necessary to be done in connection with; or conductive to, the performance of the aforesaid function.

3.3.3 Bangladesh Hi-Tech Park Authority (BHTPA)

Bangladesh Hi-tech Park Authority under the Ministry of SICT, established in 2010, is the official body of the government to boost up Hi-tech industries in the country. The major functions of the BHTPA are as follows:

a. To establish Hi-tech Park in the potential locations in the country ensuring its efficient operational management.
b. Provide policies for regulating its development, management etc
c. Provide policies for attracting local and foreign investors
d. Provide space, lease term and fixing up of rental rate
e. Fixing up terms and condition of Park developer for the PPP model projects.
f. Provide one stop services as follows;

g. Selection of Plot for the investor
h. Allocation of Plot and contract for leasing
i. Work permit for the investor
j. Assist resident /nonresident Visa for investors
k. Permission for construction
l. Arrange Water, Gas, electricity, Telephone and Internet connection
m. Other related works

3.3.4 Bangladesh Telecommunication Regulation Commission

Bangladesh Telecommunication Regulatory Commission (BTRC) is an independent Commission established under the Bangladesh Telecommunication Act, 2001 (Act no. 18 of 2001) responsible to facilitate connecting the unconnected through quality telecommunication services at an affordable price by introducing new technologies.

BTRC is also responsible for issuing licenses for IPS, Private telephone/Mobile operators, Call Centres, IP Telephony System, Vehicle Tracking Service, WIMAX Services, Third Generation (3G) Telephone, Submarine Cable System and Services etc.

3.3.5 Ministry of Information

As per allocation of business this Ministry is tasked with performing the following assignments:

(a) Audio-visual, pictorial and press coverage of all activities of the President, Prime Minister and Ministers both at home and abroad. Publicity policy-internal and external.

(b) Coordination of Publicity activities of the different Ministries/Divisions and Bangladesh Missions abroad.

(c) Press relations including journalist and other media delegations.

(d) Preparation and release of communiqués, press notes, handouts, etc.

(e) Preservation and interpretation of the policies and activities of the Government of Bangladesh through press media.

(f) Advising Government through press; keeping Government informed of the main trends of public opinion as reflected in the press and liaison between Government and the press.

(g) Administration of Press and Publication Law.

(h) Administration of Radio and Television and all other matters relating to broadcasting through Bangladesh Betar & Bangladesh Television.

(i) Policy regarding government advertisement.

(j) Community listening Schemes.

(k) Preparation of Media lists.

(l) Compulsory screening of Films.

(m) Analysis and interpretation of public opinion as reflected in the national press.

(n) Sanctioning of Cinematograph films for exhibition

(o) Administration of Cinematograph Act: Cinematograph and Censorship.

(p) Liaison with International Organizations and matters relating to treaties and agreements with other countries.

3.3.6 Ministry of Commerce

The Ministry of Commerce is responsible for the following Services:

(a) Import Policy formulation

(b) Export Policy formulation and export promotion

(c) Price Control

(d) State Trading

(e) Companies Act, Partnership Act, Societies and Trade Organization Ordinance and Law of Insurance

(f) Promotion and regulation of internal commerce and insurance

(g) Commodity issues

(h) Tariff policy

(i) World Trade Organization and International Trade Organizations

(j) Administration of 19 Commercial Wings of Bangladesh Missions abroad

(k) Administration of BCS Trade Cadre

(l) Liaison with international organizations and world bodies related to treaties and agreements

(m) Administration of sub-ordinate offices and organizations under MOC

3.3.7 Bangladesh Bank

BB performs all the core functions of a typical monetary and financial sector regulator, and a number of other non-core functions. The major functional areas include:

(a) Formulation and implementation of monetary and credit policies.

(b) Regulation and supervision of banks and non-bank financial institutions, promotion and development of domestic financial markets.

(c) Management of the country's international reserves.

(d) Issuance of currency notes.

(e) Regulation and supervision of the payment system.
(f) Acting as banker to the government.
(g) Money Laundering Prevention.
(h) Collection and furnishing of credit information.
(i) Implementation of the Foreign exchange regulation Act.
(j) Managing a Deposit Insurance Scheme.

3.4 Relevant Laws and Regulations

The legal and regulatory environment needs to be conducive to software industry growth. For enabling the development of ICT sector Government of Bangladesh provides the legal support services through different acts including ICT act, IPR protection, authorization of digital signatures, e banking facilities for e transaction, e commerce, e procurement etc. These acts are as follows:

a. Bangladesh Hi-Tech Park Act, 2010
b. Bangladesh Computer Council Act, 1990
c. BTRC Interconnection Regulations, 2004
d. The Bangladesh Telecommunication Act, 2001
e. Right to Information Act, 2009
f. Digital Certificate Interoperability Guideline, 2012
g. The Mobile Financial Services Development Report, 2011
h. Bangladesh Payment and Settlement System Regulation, 2013
i. The Information and Communication Technology Act, 2006
j. Electronic Fund Transfer Act, 1978
k. Information Technology (Certifying Authorities) Rules, 2010

3.4.1 Proposed Regulatory Framework

1. Present situation:

Government of Bangladesh has recognized the importance of establishing the ICT village for the sustained growth of the economy and increased contribution to the GDP of the country. As part of the continuing commitment, the government has taken various approaches to promote foreign investment in Bangladesh. At present ITeS industries are provided various Fiscal/Tax incentives by the government of Bangladesh in addition to the normal facilities/incentives given for the foreign investors. For the ITeS industries in Bangladesh tax free services include digital content development and management, animations 2D and 3D, GIS , IT support and software maintenance, website development and service, medical transcription services, business process outsourcing (BPO), data entry, data processing, Call centres, computer aided engineering and design, and remote IT maintenance. For addressing the cyber security digital law has been promulgated,

Intellectual Property Rights (IPR) is in place. For encouraging ITeS business through PPP model, GOB issued a separate guideline amongst others. Business on Telecom system network service including ICT, IT parks, e-service delivery to citizen and rural internet project has been included.

In order to encourage the foreign investors the government of Bangladesh offers one of the most liberal investment policies and attractive packages of fiscal, financial and other incentives. Major incentives to stimulate private sector direct investment are listed in the following table.

Table 3.2 : Existing Investment Climate in Bangladesh

Issues	Facilities /Incentives Provided
Tax Exemption	Generally 5 to 7 years
Duty	No import duty for export oriented industry. For other industries it is 5% ad valorem
Tax Law:	i) No Double taxation ii) Exemption of income tax up to 3 years for the expatriate employees.
Remittance:	Facilities for full repatriation of invested capital, profits and dividends in most situations
Exit:	An investor can wind up any time and can repatriate the sales proceeds after securing proper authorization.
Ownership:	Foreign investor can set up ventures either wholly owned or in joint collaboration with local partner.
Investing in the Stock Market	Foreign investors are allowed to participate in initial primary offerings (IPOs) without any regulatory restrictions. Also, incomes from dividends are tax-exempt for investors.
Non Resident Bangladeshi's (NRB)	Special incentives are provided to encourage non-resident Bangladeshis for investment in the country. Non-resident Bangladeshi investors will enjoy facilities similar to those of foreign investors. Moreover, they can buy newly issued shares/debentures of Bangladeshi companies. A quota of 10% has been fixed for non-resident Bangladeshis in primary shares. Furthermore, they can maintain foreign currency deposits in the Non-resident Foreign Currency Deposit (NFCD) account.

Table 3.3 : Incentives Offered by BHTPA

❑ *10 Year tax Holiday applicable from the date of commercial operations*
❑ *Exemption of Income Tax for Expatriate professionals*
❑ *10 years accelerated Depreciation permissible*
❑ *Exemption from Import Duties for construction material/eqpt, software/hardware & vehicles*
❑ *Exemption from import duties on machinery used for maintenance*
❑ *100% exemption of taxes for all Exports*
❑ *Full repatriation of Dividends/Profits & Capital permissible*
❑ *100% Equity (Ownership) is allowed for FDI companies*
❑ *No cap on FDI limits*
❑ *Hi-Tech Park will be treated as Custom Bonded Area*
❑ *Human Resources training/development will be undertaken for the Industry in the Hi-Tech Park to get right-skilled manpower at the Hi-Tech Park*
❑ *Hi-Tech Park Authority shall be the Single Window agency*

2. *Proposed regulatory facilities:*

The report ***International Good Practice for Establishment of Sustainable IT Parks*** published in 2008 by PWC of India and InfoDev sponsored by International Finance Corporation (IFC) of the World Bank recommends best practices for sustainable vibrant IT Park. The consultant of IIFC felt that the recommendations mentioned within the report are also applicable in the Bangladesh context.

According to the report, the government can play a key role in terms of formulation of the appropriate regulatory mechanism to enable and sustain IT growth. The three broad principles are as follows:

- encouraging innovation through financial and non-financial measures, including protection of intellectual property;
- promoting investments through appropriate financial & tax incentives, together with efficient and user friendly processes for implementing the policies;
- facilitating capacity building by encouraging mobility of skills, appropriate employment policies, and extending financial support to select capacity building initiatives.

The government of Bangladesh can enhance its existing current regulatory framework by implementing and building on the above-mentioned principles with emphasizing the improvements of law and order situation. However following issues may be considered under regulatory framework for the establishment of IT village:

1. Address to create business climate, political stability, corruption, effective government management, timely legal procedure and effective coordination system with all stakeholders. All this factors are related with the cost of business and profit. Foreign investors very consciously consider the governance of a country to invest. An important aspect of governance is the ease with which investors can enter and exit a market. It is an important determinant of productivity, investment and entrepreneurship.
2. Provide fiscal incentives to encourage private sector participation. This may include
    - 10 years Tax holiday
    - Duty free Import of IT infrastructure
    - Exemption from dividend Tax
    - Accelerated depreciation on machinery or plant
    - Long term (15 years) concessional interest rate in bank loan for space purchase in STP
    - Reduced Rate of interest for working capital
    - Work permits for foreign professionals can be issued by STP desk of MOICT to avoid delay to avoid delay in processing the case.
3. Better infrastructure of the host country attracts foreign investors. Inflows of the FDI depend mostly on quality and quantity of physical infrastructure like roads and highways, transport, uninterrupted power supply, gas telecommunications and so on. Banking and other financial services also affect the FDI inflows significantly.

4. Establish an effective implementation mechanism – single-window nodal agency. Such nodal create a strong coordinating committee that fosters linkages with various government ministries/departments/agencies. Such a coordinating body could be charged with approving an IT Park developers' plans, acquisition of land, and issues relating to utilities & supporting infra-structure.
5. This will also ensure a fast track clearance and approval process.
6. Promote/Facilitate IT Industries body like BASIS specifically for promoting and development of IT sector. This should provide an ideal forum for overseas and domestic companies to explore the vast potential available for Joint Ventures, Strategic Alliances, Marketing Alliances, Joint Product Development, etc.
7. Design flexible land use policies for attracting private real estate players. Flexible land use policies are required to attract private sector real estate players to invest in the development of IT parks, since such policies can ensure higher returns on investments for the developer. Such policies typically allow mixed land- use, i.e., residential, recreational and commercial land-use along with industrial land-use.
8. A vibrant and pro-active IT park management team with the proper skill sets that can manage and market new initiatives.
9. Enact long-term policies to attract private sector involvement in education; foster linkages with educational institutions and other markets, such as the capital market, to attract private funding; promote corporate governance norms so that even if some short-term measures like fiscal incentives are removed, the continued development of the sector can be ensured.

4

Description of the Site: Mohakhali

4 DESCRIPTION OF THE SITE

With a view to attaining the targets of the Millennium Development Goals, Poverty Reduction Strategy, Vision 2021 and eventually building a Digital Bangladesh, the country's planning process has been meticulously stressing upon improving of e-governance. With this end in view, Government of Bangladesh decided to develop IT parks at various places of the country including Mohakhali.

Mohakhali is one of the busiest places in Dhaka, Bangladesh. Banani is located in the north and Tejgaon Industrial area is in the south while Gulshan is in the East and Dhaka Cantonment, T & T college and T&T satellite offices are situated on the west side of the slum. Many important offices and institutions are based in Mohakhali. Mohakhali Bus terminal is one of the most important terminals of Dhaka city. Directorate General Health Service (DGHS), Bangladesh College of Physicians and Surgeons (BCPS), Institute of Health Technology, Dhaka, ICDDRB, BRAC University and Government Titumir College are situated in Mohakhali. Mohakhali fly-over, the first of its kind was opened to traffic on November 2004. Mohakhali General Market is situated beside the flyover bridge close to the Dhaka-Mymensingh highway.

4.1 District Demographics With respect to ICT Sector

Since Mohakhali is located in Dhaka, the demogrphy of Dhaka division is considered in view of analyzing the ICT growth. Dhaka Division is an administrative division in Bangladesh which consists of 17 districts. Dhaka is the capital and the largest city in Bangladesh. The division covers an area of 31,177.74 km², and has a population of 49,321,688 (Adjusted) as per 2011 Census. Dhaka Division is bounded by the Indian state of Meghalaya to the north, Barisal Division to the south, Chittagong Division on the south-east, Sylhet Division to the east, Rangpur Division to the north-west, and Rajshahi and Khulna Divisions to the west. The population density of Dhaka division is 1,521 per km² and Dhaka Zilla is 8,229 per sq.km. From the "Population and Housing Census 2011" conducted by the Bangladesh Bureau of Statistics, it was found that there were 13,099,840 individuals are in the 15-29 age group which is about 26.56% of the population of Dhaka Division. District wise population along with population density and literacy rate is shown below:

Table 4.1: Population Structure of Dhaka Division

Name of Division	Name of Zilla	Adjusted Population as per census 2011			Population Density per sq KM	% of Population in Age group 15-29 in percent	Literacy Rate in Percentage		
		Total Pop	Male	Female			Total	Male	Female
1	2	3	4	5	6	7	8	9	10
Dhaka Division		49,321,688	25,140,072	24,181,616	1,521	26.56	54.2	57.0	51.3
	Tangail	3,749,086	1,827,684	1,921,402	1,056	25.3	46.8	50.0	43.8
	Sherpur	1,421,607	703,426	709,175	995	23.8	37.9	40.2	35.7
	Shariotpur	1,201,464	581,166	620,298	984	24.1	47.3	48.0	46.6
	Rajbari	1,091,263	540,555	550,708	961	26.0	52.3	54.0	50.6
	Netrokona	2,317,191	1,154,967	1,162,224	798	22.8	39.4	40.9	38.0
	Norsingdi	2,314,889	1,147,655	1,167,234	1,934	26.5	49.6	50.6	48.7
	Narayongonj	3,074,078	1,586,418	1,487,660	4,308	32.3	57.1	59.5	54.6
	Mymensingh	5,313,163	2,640,040	2,673,123	1,163	24.2	43.5	44.9	42.2
	Munshigonj	1,502,449	749,918	752,531	1,439	27.9	56.15	56.4	55.7
	Manikgonj	1,447,298	702,807	744,491	1,007	24.6	49.2	52.6	46.0
	Madaripur	1,212,198	597,372	614,826	1,036	24.5	48.0	50.1	45.9
	Kishoregonj	3,028,706	1,489,739	1,538,967	1,083	23.6	40.9	41.5	40.3
	Jamalpur	2,384,810	1,174,104	1,210,706	1,084	23.4	38.4	41.1	35.9

Name of Division	Name of Zilla	Adjusted Population as per census 2011			Population Density per sq KM	% of Population in Age group 15-29 in percent	Literacy Rate in Percentage		
		Total Pop	Male	Female			Total	Male	Female
	Gopalgonj	1,218,319	600,514	617,805	798	25.0	58.1	60.3	56.0
	Gazipur	3,548,115	1,850,672	1,697,443	1,884	36.0	62.6	66.0	58.9
	Faridpur	1,988,697	979,582	1,009,115	932	25.5	49.0	50.3	47.7
	Dhaka	12,517,361	6,813,453	5,703,908	8,229	35.9	70.5	73.6	66.9

Source: Socio Economic Survey, 2011 by BBS

4.1.1 Literacy Rates and Education

The average literacy rate in Dhaka Division is 54.2% but a high literacy rate prevails in Dhaka (70.5%), Gazipur (62.5%), Gopalgonj (58.1%), Narayongonj (57.1%) and Munshigonj (56.15%). Out of the total population of age group 15-29 about 23.66 lacs are students including 13.37 lacs are male and 10.29 lacs are females. This indicates that Dhaka Division is a much better source of skilled labor for the IT/ITES industry.

4.1.2 ICT Courses in Educational Institutions

The Degree programs in ICT are normally considered as four years course. Students pursuing following degree programs have been considered as having education for contributing to the growth of software industry:

- CSE: Computer Science and Engineering
- EEE: Electrical and Electronics Engineering
- ETE: Electronics and Telecommunication Engineering
- APE: Applied Physics and Electronics (also includes communication and IT)
- Math: Mathematics
- Stat: Statistics
- MIS: Management Information Systems

Distribution of students in the 4 year degree programs in public and private universities of Bangladesh is obtained from BASIS survey in 2010 which is shown in the following Table:

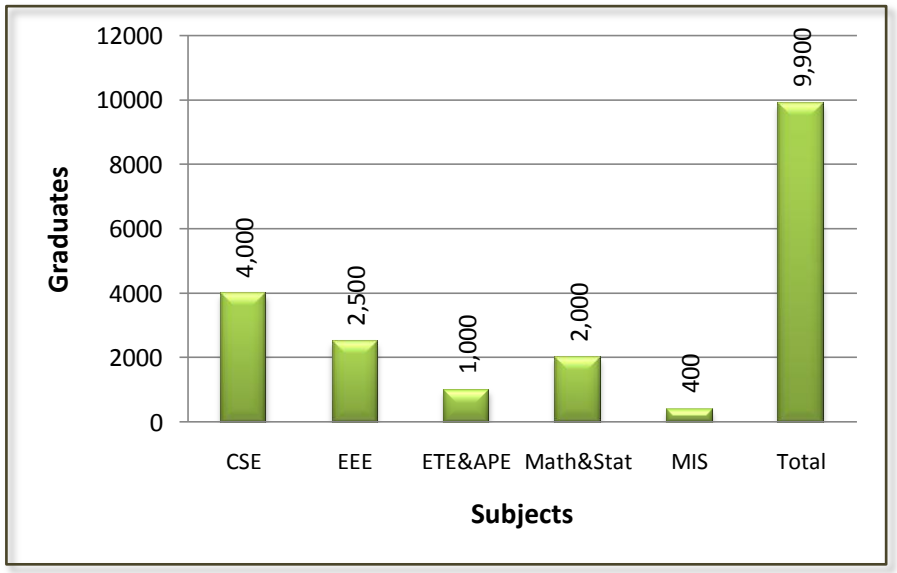
Table 4.2: Enrolment of Students for ICT Education in different Universities in Dhaka Division

Type of University	No of Universities	Type of Degree Offered					Total
		CSE	EEE	ETE & APE	Math's & Statistics	MIS	
Public Universities	22	5,662	3,841	2,949	9,072	280	21,524
Private Universities	53	17,956	8,439	2,108	141	1,590	30,234
Total	75	23,618	12,280	5,057	9,213	1,870	**51,758**

Source: *BASIS Survey 2010*

By making an assumption that 20% of the total student population enrolled in the 4-year degree program will graduate every year, yearly estimated graduate production capability of Bangladeshi universities in IT related subjects as per estimation of BASIS, was about 9,900 as shown in the following graph.

Figure 4.1: Estimated Yearly Graduates



In addition Dhaka Division have 132 Polytechnic Institutes (including 11 public and 121 private polytechnic Institutes) enroll about 10,146 IT students per year according to the University Grants Commission's Annual Report of 2012. These Institutes provides Diploma in Computer Science and Engineering (CSE), Electrical and Electronic Engineering (EEE), and Tele communication Engineering. The type of courses offered in both public and private polytechnic institutes is shown in the following Table:

Table 4.3: Enrolment of IT students in Diploma Course in Polytechnic Institutes under Dhaka Division

Type of Polytechnic Institutes	No of Polytechnic Institutes	Types courses offered			Total
		CSE	EEE	Telcom	Total
Public	11	985	1,392	177	2,554
Private	121	2,019	5,337	236	7,592
Total	**132**	**3,004**	**6,729**	**413**	**10,146**

Source: *University Grants Commission, 2012*

Assuming that 20% of the students get Diploma every year, yearly estimated IT graduate production capability of the Polytechnic Institutes would be about 2,000 per year and when added together with the university graduates it will stand at 11,900. These IT Degree/Diploma holders carry strong potential to increase core software development capability of the industry. These groups of population are very much useful for the IT/ ITES provided they are well trained in line with the requirement of IT industries.

4.1.3 Electricity and Internet

Of the total number of households in Dhaka, 97% use electricity as a source of light. There are, moreover, approximately 727,193 persons of which 65.2% are male and 34.8% are female individuals with access to internet in Dhaka (BBS, 2011). The government of Bangladesh recently introduced one stop citizen service in all Deputy Commissioner's offices of the country, including Dhaka zila. Thus citizens of Dhaka have access to and can submit documents online; those without internet access can do so through local e-service centers. There are about 85 lakh persons out of which 48.2% are male and 51.8% are female who watch Television regularly. Division wise use of electricity and internet as per BBS census 2011 is shown below:

Table 4.4: Distribution of Population using electricity, TV and Internet in Dhaka Division

Name of the Division	Name of Zilla	Use of Electricity as source of Light	Watching TV			Using Internet		
			Population	% of Male	% of Female	Population	% of Male	%of Female
Dhaka Division			23,133,182	50.4	49.6	910,653	67.2	32.8
	Tangail	56.2	1,626,639	51.2	48.8	11,554	78.1	21.9
	Sherpur	41.2	534,013	54.2	45.8	3,408	83.3	16.7
	Shariotpur	43.2	288,241	49.5	50.5	3,801	70.3	29.7
	Rajbari	45.8	403,202	53.0	47.0	6,725	80.9	19.1
	Netrokona	30.2	483,304	56.3	43.7	3,385	76.5	23.5
	Norsingdi	72.8	956,168	50.6	49.4	10,664	63.0	37.0
	Narayongonj	95.3	1,870,461	50.1	49.9	30,944	75.0	25.0
	Mymensingh	41.3	1,972,276	52.5	47.5	14,862	77.4	22.6
	Munshigonj	90.1	832,062	47.5	52.5	7,378	79.0	21.0
	Manikgonj	52.7	580,710	50.8	49.2	4,047	90.0	10.0
	Madaripur	59.3	399,280	50.9	49.1	4,298	78.0	21.9
	Kishorgonj	49.6	985,004	51.4	48.6	8,839	82.4	17.6
	Jamalpur	39.4	802,746	54.0	46.0	11,712	66.0	34.0
	Gopalgonj	49.1	294,336	51.2	48.8	2,176	95.3	4.8
	Gazipur	84.0	1,931,617	49.9	50.1	50,947	76.8	23.2
	Faridpur	48.7	653,119	52.9	47.1	8,720	62.0	38.0
	Dhaka	97.0	8,520,004	48.8	51.2	727,193	65.2	34.8

Source: *Socio Economic Survey, Bangladesh Bureau of statistics, 2011*

There are 43 separate banks with multiple branches providing banking services in Dhaka. As a result, access to credit at competitive rates is available in Dhaka.

4.2 ICT Sector Growth and Investment Trend in Dhaka

An attempt was made to collect information on the actual investment trend in ICT sector in Dhaka Division through the Annual Development programs. Unfortunately most of the IT development projects under public sector were taken up from the national level covering the investment in different areas of the country and the investment for Dhaka Division alone could not be segregated or even if segregated could not provide complete picture. On the other hand information of investment by all the private sectors like banks

and joint venture investments could not be obtained from all sources. However, for having an idea of ICT investment growth in all the economic sectors through public expenditures i.e. Annual Development program and non development budget from 2009-10 to 2012-13 is shown below.

Table 4.5: Development Projects in ICT Sector

(Tk in Crores)

	2009-10		2010-11		2011-12		2012-13	
	No of Projects/Prog	**Alloc**	**No of Projects /Prog**	**Alloc**	**No of Projects /Prog**	**Alloc**	**No of Projects/Prog**	**Alloc**
ICT Sector Projects included in ADP	36	724.46	36	859.40	48	1,519.49	49	2,796.04
ICT Sector programmes under Non development Budget	27	134.26	49	180.7	46	111.82	35	89.5
Total	63	858.72	85	1,040.10	94	1,631.31	84	2,885.54

Source: *Journey towards Digital Bangladesh Published by the Ministry of finance, 2013*

From the above table it appears that in year 2009-10, the public sector investment in ICT sector was only Tk 859 cr and there is an increasing trend from 2010-11 to 2012-13. In 2012-13 the investment stood up at Tk 2,886 cr. This shows there is a good trend of increase in the investment in ICT sector. This investment growth has a positive impact of ICT sectoral growth in Dhaka.

In order to investigate the ICT sector investment trend of the local ICT player in the private sector, IIFC conducted a purposive market survey to collect information from the member companies of Bangladesh Association of Software and Information Services (BASIS) which has 800 members based in Dhaka. The sample size was considered as 50, which was more than 6% of total population. IIFC chose the companies for survey based on Software Development and Services, Business Process Outsourcing, ICT Training, Hardware Sales and Services etc. and their estimated investments.

IIFC selected the companies purposefully that have a mixture of these five types of business. IIFC also collected the list of freelancers who was actively participated in freelancing from BASIS. In this regard, IIFC developed an online survey questionnaire form. IIFC send the form to the listed freelancers and request them to fill up within a specified time period.

On the basis of the detailed analysis the survey indicated that there is a great potential for growth, which has been speed up recently mainly due to various positive activities of the present government. The reasons behind this increasing trend are availability of proper facilities for doing businesses like low rent office space, other physical facilities like nonstop/ stable power supply, internet connectivity, gas, telephone etc.

4.3 Site Location and Description

The site is located at 23°47' 7" N to 90°24'45" E in Dhaka City. It is like a peninsula surrounded by the Banani Lake on three sides. It is bounded by Banani Road No. 5 to the north and by the Gulshan-Banani Lake to the east. BRAC Centre lies to the south of the site, while the T&T Colony and BTCL Satellite Office are situated on the west side. In short, it can be said that the site is bounded by the following distinctive landmarks:

- On North: Banani Road
- On South: BRAC Center
- On East: Gulshan-Banani Lake
- On West: T&T Satellite

The land area of the proposed site for the development of Mohakhali ICT Village is 47 acres. The proposed site has some unauthorized occupied slums.

4.4 Site Ownership

In 1989, 90 acres of land was allocated to the Public Works Department (PWD) out of a total 170.4 acres in Mohakhali-Lalasharai-Karail Mouza, owned by the BTTB (which was converted to BTCL in 2008). The purpose of the allocation was to establish government buildings. The ruling government at that time also allowed slum settlements for 3rd and 4th class employees of BTTB on the same land. This gradually grew into the Karail Slum, currently one of the largest slums in South Asia. In December 1999, 47 acres out of the 90 acres PWD land, was transferred to the Ministry of Science and Information & Communication Technology (MoSICT), with the intention of establishing an ICT Village.

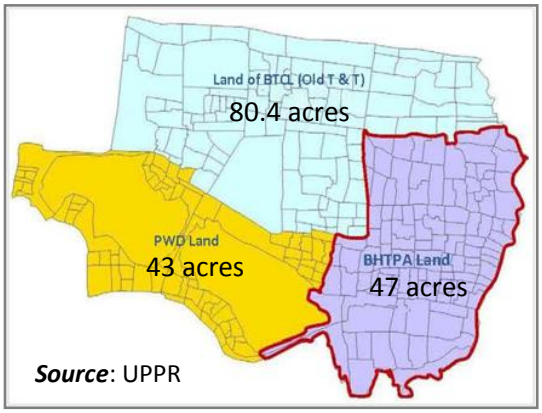


Table 4.6: Land Ownership of the Surrounding Area

	Name of the Owner	Land Area (acres)
1.	Bangladesh Hi-Tech Park Authority	47

	Name of the Owner	Land Area (acres)
2.	Public Works Department	43
3.	Bangladesh Telecommunications Company Ltd.	80.4
	Total	**170.4**

The details of the land schedule of the proposed site are shown below:

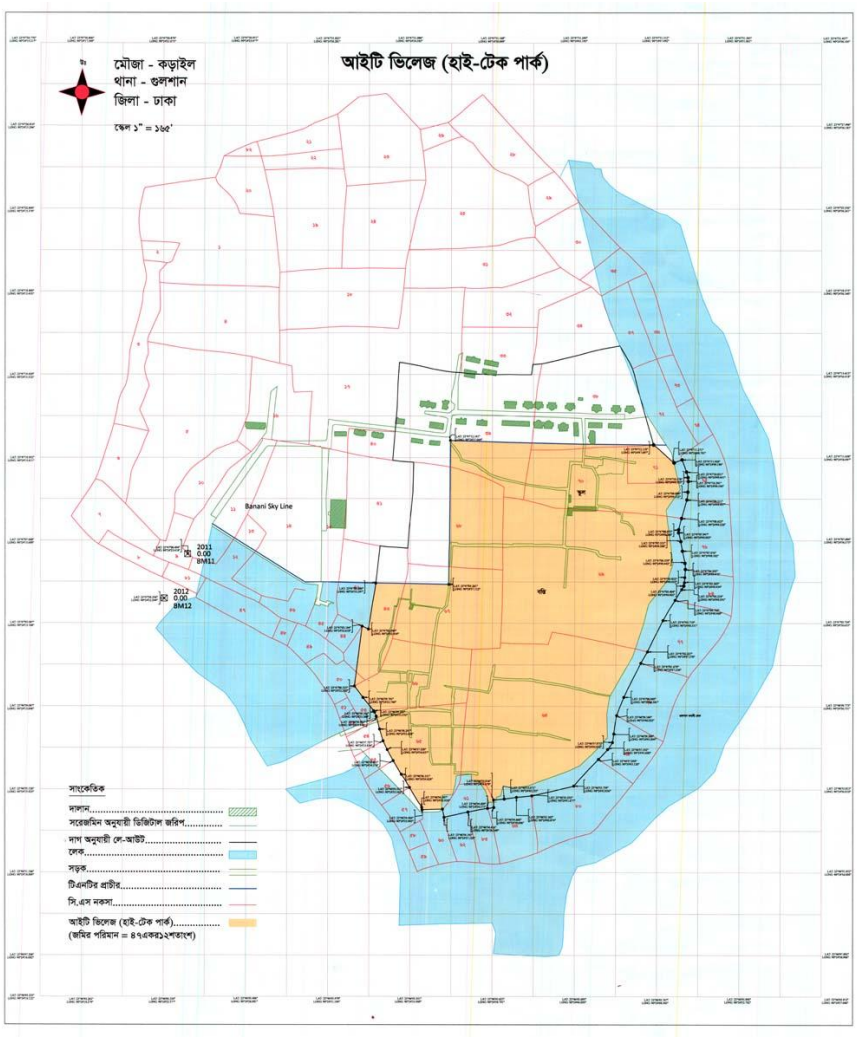
Table 4.7: Details of Land Schedule of the Proposed Site

District	Mouza & J.L. No.	Ward No.	Khatian No.	Dag No.	Area of Proposed Land (acres)	Full/ Partial Land area
Dhaka	Mouza: Karail J.L.-276	19	01	38	0.51	Partial
		19	01	39	2.4	”
		19	01	43	1.22	”
		19	01	50	0.04	”
		19	01	61	0.58	Full
		19	01	64	11.7	”
		19	01	65	3.58	”
		19	01	66	3.23	”
		19	01	67	3.8	”
		19	01	68	2.5	”
		19	01	69	12.22	”
		19	01	70	4.3	”
		19	01	71	0.92	”
		Total			**47**	

4.5 Digital Site Survey

BHTPA recognized the necessity for a digital survey as they find it difficult to identify the boundary of the project site. As a result, they made a formal request to the Directorate of Land Records and Survey (DLRS) to conduct a digital survey to prepare a digital map and demarcate the boundary of the project site. In view of this, a group of officials from the DLRS was engaged for conducting the survey in March 2013. After the completion of the survey, a digital map was prepared on 47 acres of BHTPA land according to the respective daag nos of the land schedule.

Figure 4.2: Digital Map of BHTPA Land at Karail, Mohakhali



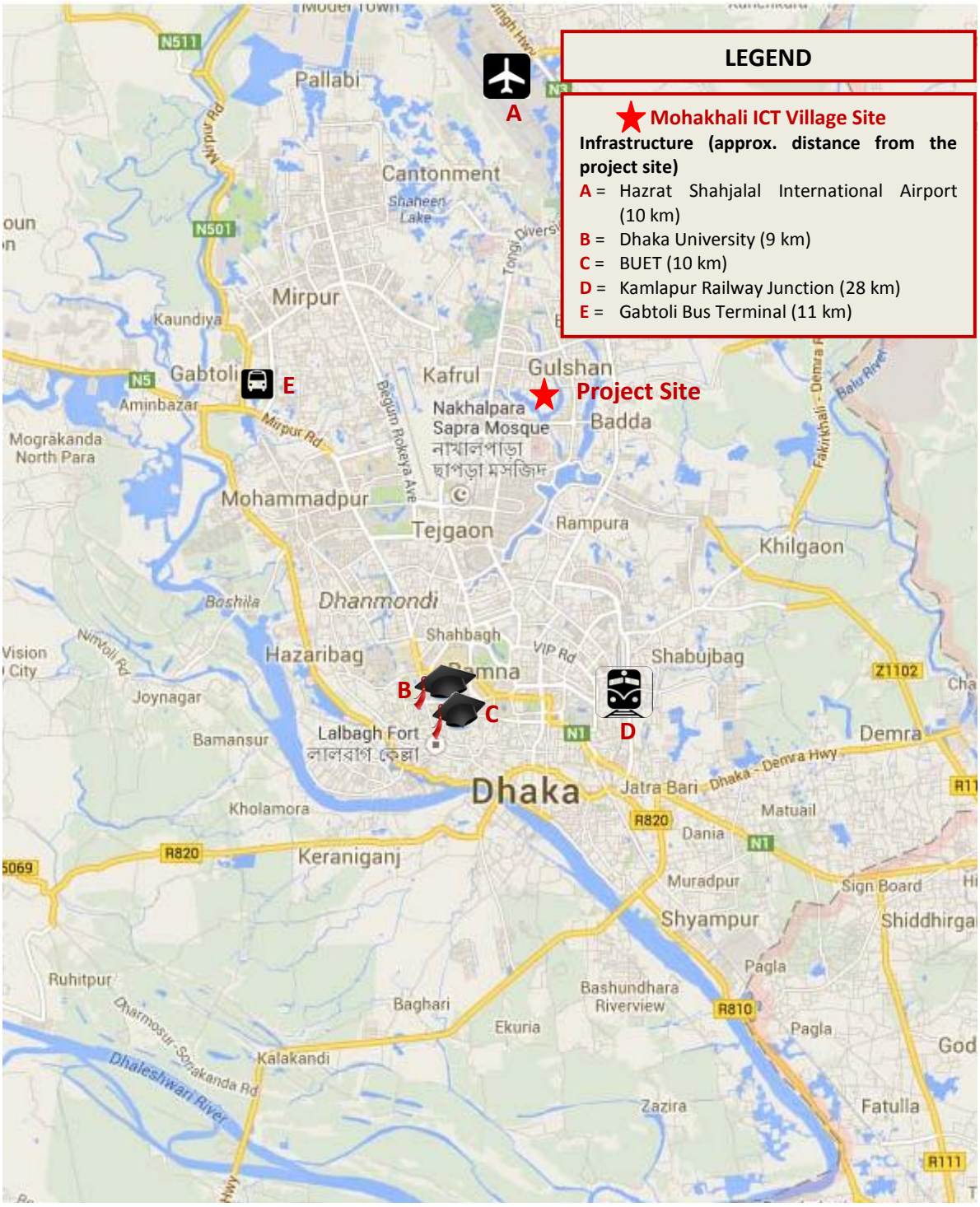
The map shows that around 3 acres of land falls within the Gulshan Lake. Hence, it is assumed that the remaining 44 acres of land would be available for the construction of the project. The digital map is provided in Annex H.

4.6 Offsite Infrastructure to the Site

4.6.1 Access Road

The proposed project site is accessible through two pathways and one waterway. The main access road is Banani Road No. 5, which connects the site to the north. The other road is a narrow walkway that links the site with a local street called Adeal Road to the southwest corner. To the south, lies Banani Lake, which provides access to the site by means of small passenger boats. Both Adeal Road and the water access route directly connect with Bir Uttam AK Khandaker Road, which is the main connecting route between Mohakhali and Gulshan. Additionally, both Banani Road No. 5 and the Bir Uttam AK Khandaker Road eventually link up with the Dhaka-Mymensingh Highway.

Figure 4.3: Major Socio-Economic Infrastructures and the Project Site



4.6.2 *Power Supply*

Reliable power supply is extremely critical for the success of the ICT Village. The Gulshan S&D is the concerned division under DESCO responsible for supply electricity to the project site and the surrounding areas. The nearest sub-station (33/11 kV) is located in Banani Road No.1, which is 1.3 km from the site. The second nearest substation (33/11 kV) is located at Gulshan 1, is about 3 km away.

Figure 4.4: Location of Nearest Sub-stations from the Project Site

4.6.3 *Broadband Network Connectivity*

A robust infrastructure for high-speed internet connectivity is essential for attracting investment and ensuring the sustainable operation of the ICT Village. On top of that, it is imperative to have connectivity from multiple operators to maintain high uptime and seamless service levels to the tenants. The demand analysis reveals that the bandwidth requirement for the ICT Village would be couple of three hundred Mbps in the first five years of its operation. The requirements will increase gradually along with the tenant occupancy. It has been found that all the three NTTN operators have their POPs (Point of Presence) in the vicinity of the project site and capable of providing expected level of services to the proposed ICT Village as far as high-speed optic fiber connectivity (data and voice) is concerned. Any operator with sufficient capability may provide network connectivity inside the ICT Village and maintain their clientele among tenants independently. This will prevent any single operator from enjoying monopoly and foster a climate of healthy competition among the service providers for providing optimal level of service to the tenants.

5

Market Survey

5 MARKET SURVEY

Market survey plays a very important role in making decision of an investment project. The sample size is an important feature of any study in which the goal is to make inferences about a population from a sample. Basically sampling is the process by which inference is made to the whole by examining a part of the total population. The sample size used in a study is determined based on the expense of data collection, and the need to have sufficient statistical power.

Various sampling techniques can be used depending on the type of research to be conducted. The two major types of techniques are (a) probability sampling and (b) non probability sampling.

(a) Probability Sampling - any sampling procedure that specifies the probability that each member of a population has of being selected. Probability sampling techniques include:

- Random Sampling - a group drawn from the population, with every member of the population having an equal chance of being selected. This is the most common and highly recommended technique.
- Stratified Sampling - a group selected from a population that reflects accurately certain segments of a population. In this type of sample, certain segments or traits are identified as important to the research and the sample selected is controlled to insure that those traits are accurately represented.
- Cluster Sampling - is used when certain groupings important to the research are already established. This is frequently the case when studying teaching techniques in classroom settings. Rather than the sample of students being taught, the classes (groupings) of students need to represent the larger population (i.e. all fourth grade classes).

(b) Non probability Sampling - any sampling procedure that cannot specify the probability that each member of a population of being selected. Non probability sampling is used when probability sampling is not feasible. Non probability sampling techniques include:

- Convenience Sampling - a group of participants in a study are selected that happen to be available. In educational research, convenient sampling is used frequently by teachers who use their own classes for their research. Findings from such research generally are limited to the population studied and not extended to larger populations.
- Purposive Sampling - A purposive sample, also commonly called a judgmental sample is a type of non probability sampling where the researcher consciously selects particular elements or subjects for

addition in a study so as to make sure that the elements will have certain characteristics pertinent to the study. It normally targets a particular group of people.

In the present market survey purposive sampling has been chosen for some specific objectives. In Chapter 2 of this study it has been mentioned that BASIS recently carried out a survey on three hundred of its member companies in 2012. This survey sought to identify the business nature, volume and size of IT/ITES companies. In excess of 70% of surveyed companies were found to be involved in development and maintenance of software for their clients. A number of these companies also engaged in providing different IT enabled services to their clients. In total, almost half of the surveyed companies were involved in providing a range of IT enabled services as follows:

(a) Software Development and Services
(b) Business Process Outsourcing,
(c) ICT Training,
(d) Hardware Sales and Services and
(e) Other

To enter into the competitive market of the IT world, above nature of work seems to be comparatively easy and less technical than other ITES jobs for the Bangladesh perspective. Therefore while creating facilities for the proposed IT village importance has been given for evaluating the demand of such nature of business. In view of this the purposive sampling has been chosen.

5.1 Market Survey Methodology

5.1.1 Sample size

IIFC is conducting a survey to seek feedback from the businesses to understand

- current market situation
- supply and demand
- sectoral growth of ICT
- public perception of ICT Villages

To explore the market demand and industry trends of ICT industries for the development of ICT Villages at Mohakhali, IIFC surveyed the ICT companies at Dhaka.

IIFC formed a survey team consisting of 5-6 people. The survey team conducted face to face interview of 50 selected ICT Companies (both software and hardware development) located at Dhaka. Apart from the ICT

companies, IIFC team surveyed 22 freelancers through development of online survey form.

Table 5.1 : Survey Modality

ICT Companies/ Freelancers	No. of Companies/Freelancers Surveyed
ICT Companies at Dhaka	50
Freelancers	22

5.1.2 Choice of Companies

Since the ICT village will be located at Mohakhali, it was decided to carry out the survey among companies located at Dhaka City. The team had elaborate discussion and training sessions on clarity of each individual question in the questionnaire, on targeted response of the questions, how to ask the questions, and for sensitive ones, how to get answers without asking the question directly etc.

Bangladesh Association of Software and Information Services (BASIS) has 800 member companies based in Dhaka. IIFC has considered these listed companies as total population for survey of ICT companies in Dhaka. The sample size is considered as 50, which is 6% of total population.

IIFC chose the companies for survey based on their type of businesses. IIFC categorizes the businesses into the following five types:

(a) Software Development and Services,
(b) Business Process Outsourcing,
(c) ICT Training,
(d) Hardware Sales and Services and
(e) Other.

IIFC selected the companies that have a mixture of these five types of business. IIFC also collected the list of freelancers who was actively participated in freelancing from BASIS. In this regard, IIFC developed an online survey questionnaire form. IIFC send the form to the listed freelancers and request them to fill up within a specified time period.

5.2 Survey Questionnaire

Two sets of questionnaire were prepared by IIFC separately for ICT companies at Dhaka and also Freelancer. The survey questionnaires are provided in Annex E.

5.3 Survey Findings

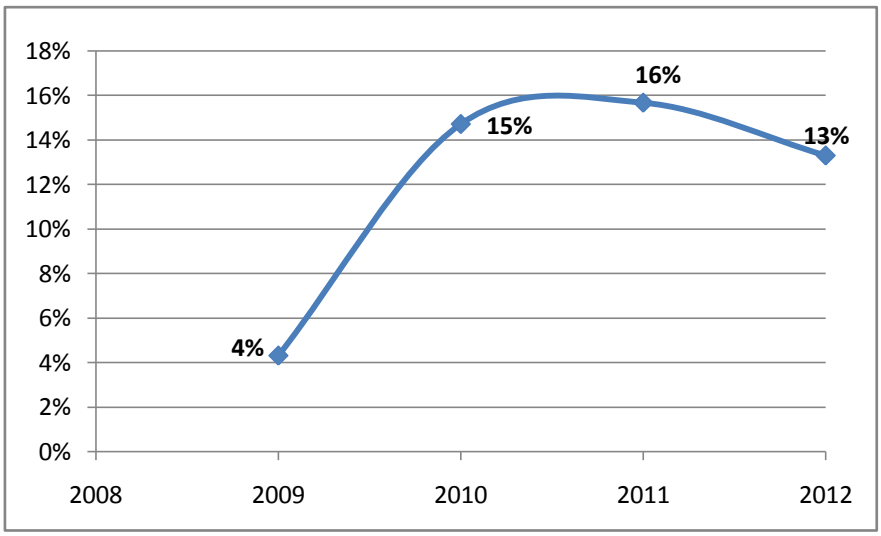
The raw data were compiled for each of the companies/freelancer surveyed, as appropriate. The results are shown separately for ICT companies and for freelancers. The findings are briefly analysed below.

5.3.1 Findings from ICT Companies Surveyed

a. Growth

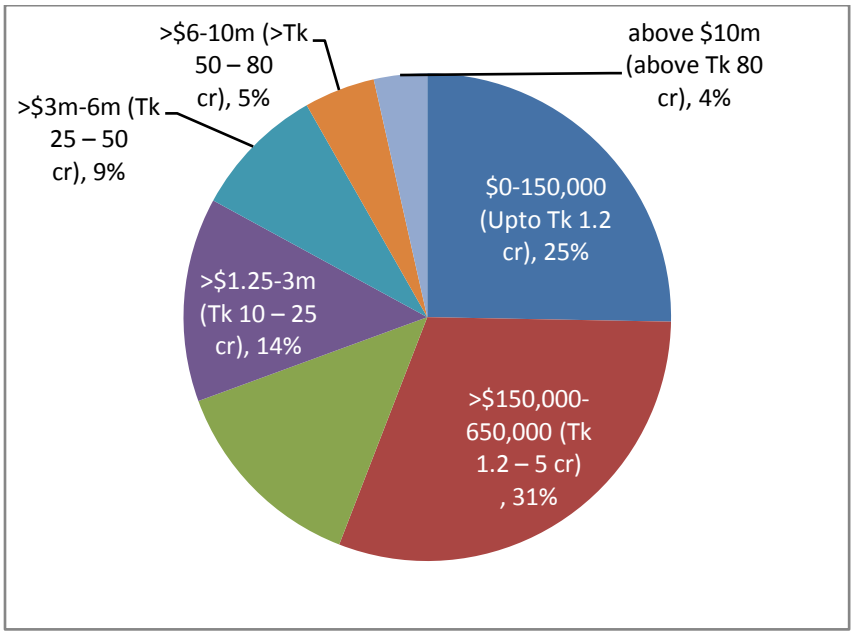
The following table shows the income growth of ICT companies in Dhaka for the last four years. According to the survey, growth rates in year 2010 and 2011 are higher compared to year 2009. But rate also falls down in year 2012 with respect to year 2010 and also year 2011.

Figure 5.1: Growth of ICT Industry at Dhaka



Overall the survey found that there is a great potential for growth, which has been speed up recently mainly due to various reasons. The reasons behind this increasing trend are availability of proper facilities for doing businesses like low rent office space, other physical facilities like nonstop/ stable power supply, internet connectivity, gas, telephone etc.

Figure 5.2: Income of ICT Companies



The above figure shows that 25% of companies in Dhaka fall within the income range of USD 0-150,000 (upto Tk. 1.2 cr). Majority (31% of companies) fall within the income range of > USD 150,000-650,000 (Tk. 1.2-5cr). 14% of companies fall within the income range of >USD 650,000-1.25 m (Tk. 5-10 cr) and 1.25-3 m (Tk. 10-25 cr). Very few companies fall within the income range of > 3 m (>Tk. 25 cr).

The survey team found eagerness amongst the ICT companies to improve quality, to be able to supply to the local consumers as well as to export. They felt tremendous confidence among the ICT companies, and an overwhelming interest for moving to an ICT Village.

b. Utility Expenses

The average utility expenses of the 50 ICT companies surveyed in Dhaka are shown in the following table:

Table 5.2 : Utility Expenses

	Space Rental (Tk./sft)	Electricity bill (Tk. /month)	Fuel cost for generator (Tk. /month)	Bandwidth Cost (Tk. /month)
Av. value	54	32,000	8,600	16,000
No. of companies			50 (all)	

From the above table, it can be concluded that space rental of Tk. 54 per sft is quite high. Electricity bill and fuel cost are also not so low. Average bandwidth cost is also high.

The following table shows the category wise utility expenses:

Table 5.3: Utility Expenses (category wise)

Type of Services	Requirements		Expenditure (Taka/month)			
	Space (sft)	Bandwidth (Mbps)	Space	Bandwidth	Electricity	Fuel cost for Generator
1. Software Development and Services	4,400	3	239,000	18,000	62,968	22,030
2. Business Process Outsourcing	1,800	6	98,000	38,000	17,421	2,625
3. ICT Training	2,000	2	109,000	12,000	17,274	5,000
4. Hardware Sales and Services	3,9000	1	212,000	7,000	50,392	12,420
5. Other	2,0000	1	109,000	5,000	12,625	963

From the table, it is evident that bandwidth cost per month is high for Business Process Outsourcing due to requirement of high bandwidth speed. Electricity cost, generator, fuel cost and space rental are higher for software development and services due to its higher percentage of space utilization and significant consumption of electricity.

c. Space Requirement

The response to this question is given in the following table in terms of space (in sft) required to set up business in ICT Village.

Table 5.4: Space Requirement to set up Business at Mohakhali ICT Village

Space (sft)	No of Companies	Percentage
500 sft	0	0%
1,000 sft	6	17%
1,500 sft	4	11%

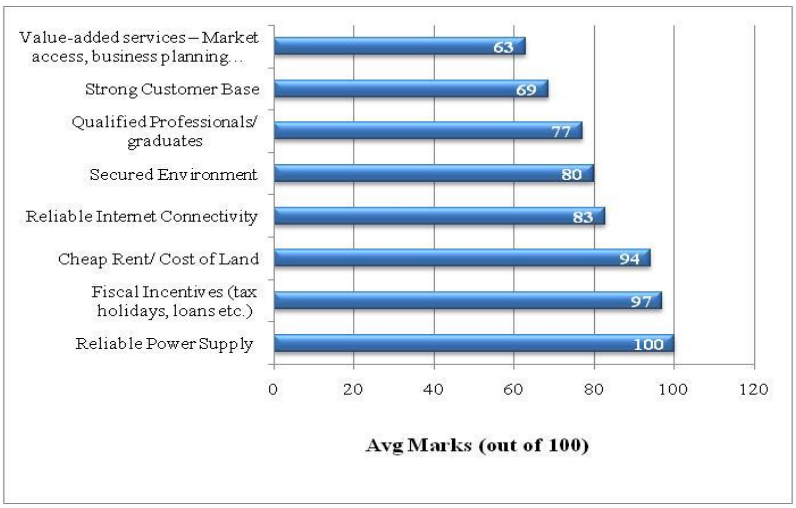
Space (sft)	No of Companies	Percentage
2,000 sft	17	47%
above 2,000 sft	9	25%

It appears that the majority responded for 2,000 to above 2,000 sft space for business.

d. Facilities Needed in the Village

The following figure ranks the importance of different facilities expected by the ICT companies at Dhaka to set up business at ICT Village.

Figure 5.3: Importance of Different Facilities in the Village

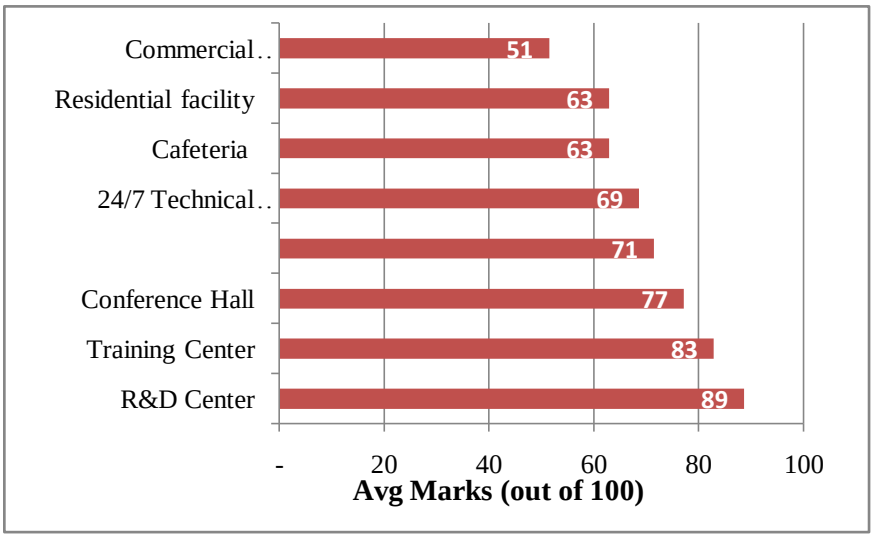


From the above figure, it can be concluded that reliable power supply is the most priority need of ICT companies in Dhaka. The next items include fiscal incentives, cheap rent/ cost of land, reliable internet connectivity, and secured business environment. Qualified professionals/ graduates in the park, strong customer base and value-added services (Market access, business planning and operational support, or resource mobilization) also get the lowest rankings.

e. Expected Ancillary Facilities in the Village

The following figure ranks the importance of different ancillary facilities that are expected by the Dhaka based ICT companies to set up their business in the ICT Village.

Figure 5.4: Importance of Different Ancillary Facilities in the Village

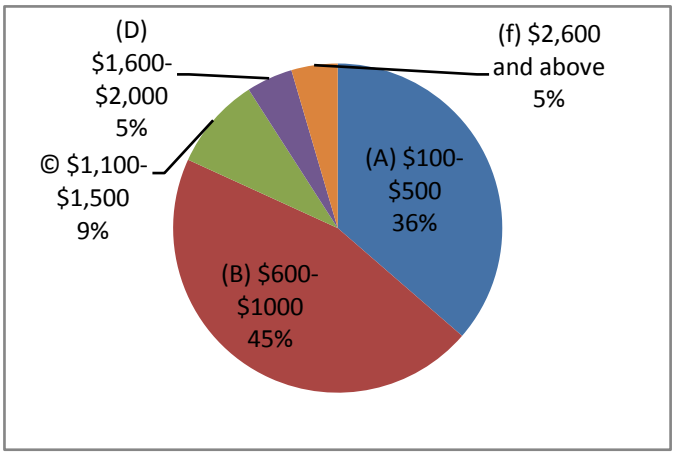


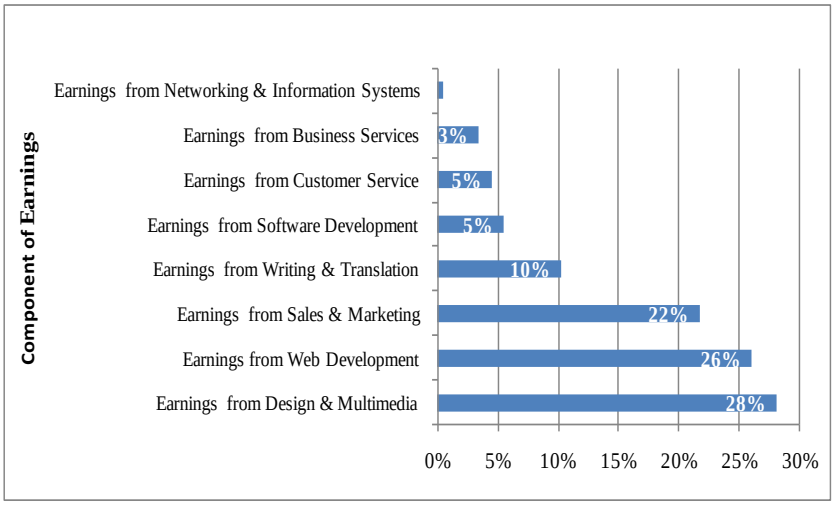
Above figure shows that R&D Center stands out as the most important facility with availability of training center following next. Availability of conference hall is the third important factor for the Dhaka based companies. Single window service and 24/7 technical support are the other important factors with cafeteria and residential facility having similar importance. Availability of commercial complex is the least important factor for Dhaka based companies.

5.3.2 *Findings from Freelances Surveyed*

a. Monthly Income through Freelancing

The following diagram show the monthly income range of freelancers surveyed. The above figure shows that the largest proportion (45%) of freelancers surveyed fall within the income range of $600 - $1,000 per month. The second largest proportion (36%) of freelancers surveyed fall within the income range of $100 - $500 per month. of Very few freelancers (5%) fall within the income range of $1,600-$2,000 and $2600 and above.





It is found that most of the freelancers responded that the main components of their earnings are design and multimedia, web development, sales and marketing etc. The other components of earnings like writing and translation, software development, customer services, business services etc have very little impact on their income.

b. Utility Expenses

The average utility expenses of the 22 freelancers are shown in the following table:

Table 5.5 : Utility Expenses

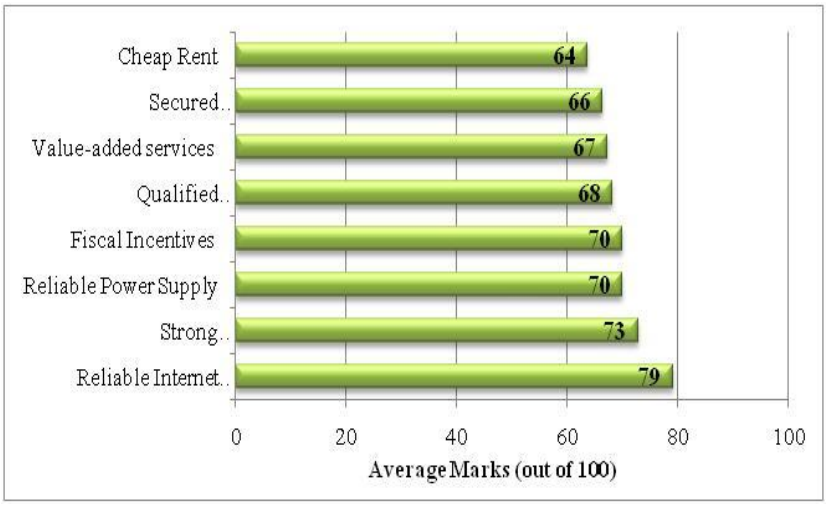
	Bandwidth Requirement (Mbps)	Bandwidth Cost (Tk. /month)
Avg. value	1.4	3,432
No. of Freelancers	22 (all)	

From the table, it is evident that bandwidth cost per month is high for freelancers due to requirement of high bandwidth speed.

c. Facilities Needed in the Village

The following figure ranks the importance of different facilities that are needed to set up business at ICT Village.

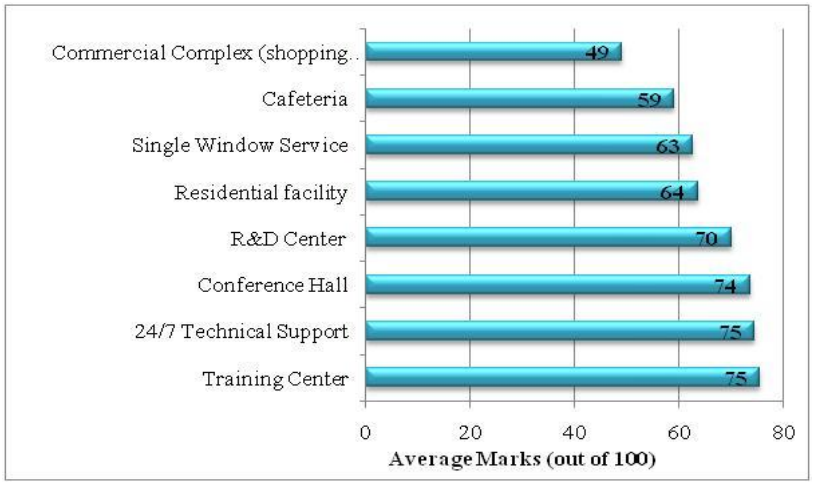
Figure 5.5: Importance of Different Facilities in the Village



From the above figure, it can be concluded that reliable internet connectivity is the most priority need of freelancers. The next items include strong customer base, reliable power supply and fiscal incentives. Cheap rent/ cost of land, secured business environment, value-added services (Market access, business planning and operational support, or resource mobilization) and qualified professionals/ graduates in the park also get the lowest rankings.

d. Expected Ancillary Facilities in the Village

The following figure ranks the importance of different ancillary facilities that are needed in the ICT Village.



It appears that availability of training center is the most important factor among the ancillary services according to the above figure. Having 24/7 technical support, conference hall, and R&D Center are the next priorities. Residential facilities, Single Window Service are the other factors with later two factors having similar importance. Commercial Complex (shopping mall etc) in the park and Cafeteria get the lowest rankings.

5.4 Profile of Industrial Enterprises

The salient features from the findings relevant to the ICT villages are presented in the following sections:

5.4.1 Type of Services

According to the survey, most of the ICT companies in Dhaka have the following type of business i,e (1) software development and services (2) Business Process Outsourcing, (3) Training, (4) hardware sales and services and (5) Other. But in Sylhet most of the companies are hardware based. Very few Companies have software business, which includes inventory, automation, enterprise resource planning, billing software, online and offline security software development.

The following table shows the survey findings with respect to type of services vs average bandwidth Speed (Mbps) and average space requirement (sft).

Table 5.6: Type of Services Vs Bandwidth and Space

Type of Services	Average Space Requirement (sft)	Average Bandwidth Requirement (Mbps)
1. Software Development and Services	4,400	3
2. Business Process Outsourcing	1,800	6
3. ICT Training	2,000	2
4. Hardware Sales and Services	3,900	1
5. Other	2,000	1

5.4.2 Number of Employees

Number of employee with respect to type of services is shown in the following table:

Table 5.7: No of Employees

Type of Services	ICT Engineering Graduates (hardware)	Graduates/ Diploma in Software	General Science Graduates	Other Graduates	Total
Software Development and Services	29	24	14	25	92
Business Process outsourcing	9	7	19	77	112
ICT Training	26	14	50	109	199
Hardware Sales and Service	33	18	148	147	346
Other	5	7	37	19	68

5.4.3 Average Salary of Professional

Average monthly salaries of professionals are shown in the following table:

Table 5.8: Average Monthly Salary of Professional

Occupation Title/Skill level	Monthly Salary (Tk.)		
Experience *(Yrs)*	**(2-5) *Yrs***	**(5-7) *Yrs***	**(7-9) *Yrs***
System Architect; System Analyst; ICT Consultant	49,559	76,250	94,688
Database Administrator	38,133	58,462	69,375
System Administrator; Internet Programmer; Database Designer; Technical Writer; Web Site Designer; Software Quality Controller; Application; Telecommunication Engineering	46,022	59,813	89,286
Multimedia Specialist; Network Engineering; Web Site Developer	31,690	64,000	75,667
Management Employees (HR, Admin, Accounts, Marketing)	33,446	55,000	73,667

5.5 Measures for Enhancing Competitiveness of the Park

To make the services provided in the ICT village cost competitive, the following measures need to be taken in the manner suggested.

5.5.1 Reliable Power Supply

One of the major factors of competitiveness is the continuous availability of adequate electrical power. ICT villages require reliable power supply. Power interruption increases the cost of services due to wastage of time and frequent problems with hardware.

5.5.2 Cheap Rent

Cheap rent/cost of land was one of the factors that was given a high importance by the respondents. Usually this is the single most expensive factor that increases the total investment in a new venture.

5.5.3 Reliable Internet Connectivity

Market survey indicates that, reliable internet connectivity increases the competitiveness of the park. ICT villages require reliable internet connectivity to ensure efficiency and quality of service.

5.5.4 Fiscal Incentives

According to the market survey, capital is a constraint for all the ICT companies. ICT companies want support from the Government. Therefore, fiscal incentives like tax holiday, low interest rate loan etc were also one of the factors, which increase the competitiveness of the park.

5.5.5 Measures for improving quality, R&D, training and information

There is a need for improving the quality of services provided by the ICT companies. Particularly in software development and services most of the professionals need training to improve their skills. A few training programmes offered by some local and international bodies have helped some of the professionals in improving the quality of service significantly.

Most of the professionals now realise that they need R&D to improve and diversify their services. However, they do not have any idea how to go about this. Sometimes they get some help from technological universities in the country, but some of them tend to be very expensive for the ICT companies to afford. Therefore, if the ICT village could organise a central R&D centre offering service at a reasonable cost, this could have a significant impact on the quality improvement and diversification of the ICT villages in Bangladesh.

Regular training of professionals could also be taken up through such a centralised facility. Financing of such centralised facilities could be done through a co-operative of the ICT companies housed in the village.

There is a need for specialization and interaction among ICT companies which helps in improving quality, and in making the services cost-effective. Since most of the companies were scattered so far, they did not have much opportunity to explore this option.

Again, the ICT village will offer them collective bargaining strength to rectify many of the policies of the government which hindered the growth of ICT industries of Bangladesh. The anticipated changes will not only help those in the village, but also benefit the country as a whole.

Therefore, the proposed ICT village will definitely offer opportunities for bringing a significant qualitative change to the Bangladesh ICT Industry and would be a pioneer in its own right.

6

Demand Forecast

6 DEMAND FORECAST

Demand forecast is a key element of the feasibility study, which determines the development potential of the site. In this demand forecast, the team identified: i) different category of businesses of ICT industry that are most likely to be located in the village, ii) the number of tenants to be proposed, and iii) the space and infrastructure requirements of units proposed for the ICT village over a 30-year period.

With this information, assumptions were made and three demand scenarios (base case, optimistic case and conservative case) were produced. These scenarios were then used to obtain a realistic view of the requirements for demand condition, development need and timeframe of the project.

6.1 Purpose of Demand Forecast

The demand forecast has been made broadly for the following purposes:

a) **Determine the ideal size of space.** The demand forecast informs about the size of space necessary to accommodate the projected demand in the ICT village in a given location.

b) **Estimate the cost of ICT Village development and operation.** The larger the demand, the more space must be developed and the more services required to operate in the village.

c) **Estimate ICT Village revenues.** The revenues of the village will be directly proportional to the demand for space in the village.

d) **Determine economic benefits**. The demand forecast provides information such as the number of tenants and number of employees per tenant.

6.2 Standardisation of Industry Sub-categories

The core leasable area of the ICT Village includes the following two constructions and development:

1. Multi Tenant Building (MTB) No 1
2. Multi Tenant Building (MTB) No 2

The MTB is intended to house core IT/ITeS businesses. This will be a 30-storied steel structure commercial building of 150,000 sft for one MTB. Both MTBs will have total leasable space for office of total 1,971,200 sft. Based on the findings and experience gathered from the survey, a standardization of the industry sub-categories were made based on the services they provide. The demand for space and other utilities have also been forecasted based on the requirements of these sub-categories. The standardised values are presented in Table 6.1 for MTB:

Table 6.1: Standardization of Sub-categories of Industries for One MTB

	Sub-category	Suggested Number of units	Space Requirement (sft/tenant)	Number of Employees/tenant	Bandwidth Requirement (Mbps/tenant)
1.	Software Development and Services	448	1,500	19	1
2.	BPO	149	1,500	30	1.5
3.	Training	30	1,500	25	0.6
4.	Other	30	1,500	34	0.1
	Total no of Units	**657**			

6.3 Demand Forecast Methodology

A large portion of Bangladesh's ICT industry is concentrated in the capital city of Dhaka. As a growing megacity it offers many options for entrepreneurs, and this is especially true for the hi-tech industry. Dhaka offers many advantages for ICT based businesses, such as reliable internet and power connectivity, well equipped IT educational facilities, and most importantly, a healthy market for IT services itself. The implementation of large scale automation projects in sectors like banking, telecom, pharmacy, garments and textile have increased the domestic demand for software and ITeS. ICT companies based in Dhaka have easily been able to reap the benefits of this rapidly growing local market. Their ideal location, combined with the availability of better resources has allowed them to grow and is also helping them to become increasingly competitive on a global scale. Many companies and independent freelancers have started entering the foreign market by way of international outsourcing.

The construction of an ICT Village in Mohakhali will serve as an ideal opportunity for bringing together the many Dhaka based companies in the field into one common platform. As the industry continues to evolve and grow, there will be a growing demand for IT enabled services both locally and globally, and initiatives like ICT villages can play a substantial role in this regard.

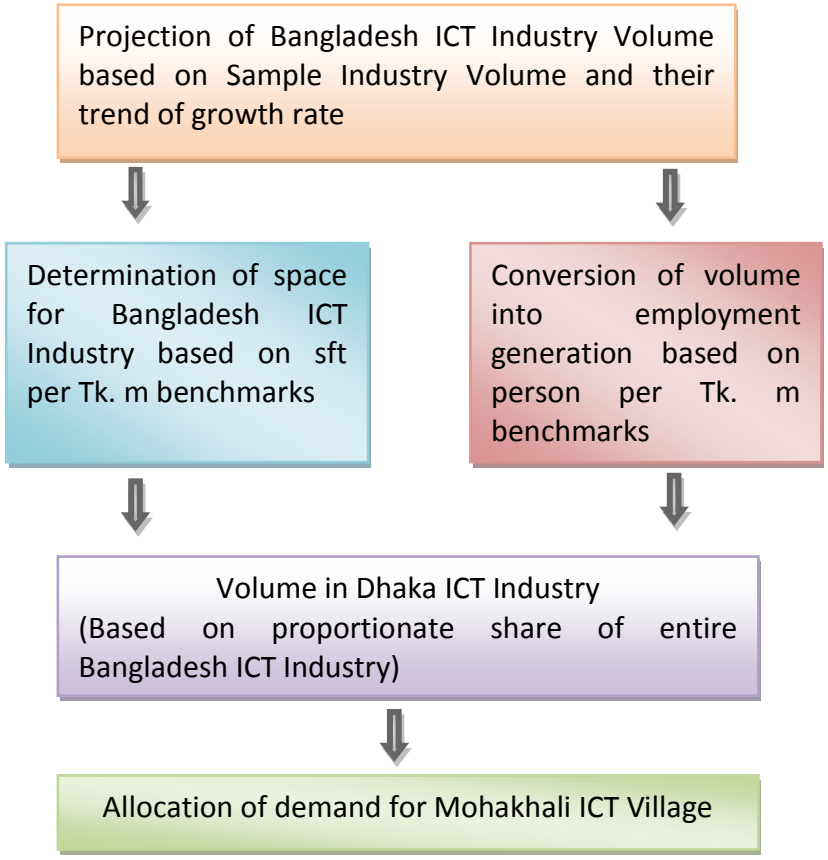
With inputs from market survey, the demand forecast of Mohakhali ICT village has been carried out. Based on historical data of sample industry volume and their trend of growth rate, the forecast growth rates are

determined for a period of thirty years. From the surveyed data, the three different factors are generated:

1. Factor for Space Requirement per person (SRP) - (sft/person)
2. Revenue Earning Factor (REF) - (Tk. m/person)
3. Bandwidth Capacity Factor (BCF) - (Mbps/person)

Based on these factors, the demand for space requirement (sft/Tk m), employment generation (person/Tk. m) and bandwidth requirement (Mbps/Tk. m) of Bangladesh ICT Industry for a period of thirty years are determined. The ICT sector mainly concentrates in Dhaka, the capital city of Bangladesh. According to a survey conducted by BASIS, the total market size of Bangladesh ICT Industry is USD 800 million.

Figure 6.1: Demand Assessment Methodology for Mohakhali ICT Village



Determine the volume of Dhaka ICT Industry based on total market size of Bangladesh ICT Industry and determine the volume of Mohakhali ICT Village based on volume of Dhaka ICT Industry.

Though the IT sector mainly concentrates in Dhaka, the capital city of Bangladesh, the volume for Dhaka ICT Industry is considered as 82% of total Bangladesh ICT Industry. However, there are still further improvements that can be made in equipping the labour force in Dhaka for large-scale operations

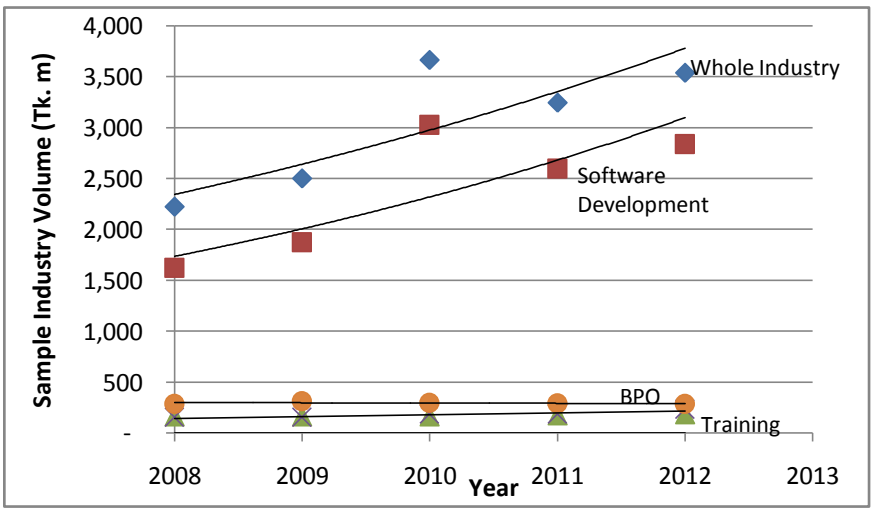
in IT/ITES; there is a need for formal and informal apprenticeship programs to equip local youth in Dhaka. There is also a need for a marketing campaign in Dhaka to increase awareness about opportunities in IT/ITES to the local population.

Therefore, the volume for Dhaka ICT Industry is considered as 82% of total Bangladesh ICT Industry. The volume for Mohakhali ICT Village is considered as 85% of total Dhaka ICT Industry. Industry volume of Mohakhali ICT Village is derived for a period of thirty year based on the forecast growth rates. Based on the industry volume, the space requirement, bandwidth requirement and employment generation of Mohakhali ICT Village is also generated.

6.4 Sample Industry Volume

The last five years data of sample industry volume (Tk. m) with respect to type of services; Software development, BPO, Training, Other and Whole Industry are shown in the following figure:

Figure 6.4: Sample Industry Volume (Category Wise)



It can be concluded from the above figure that the industry for software development are growing rapidly with respect to time. For this reason, the curve shows an increasing trend. However, the curves for BPO, Training and Other remain constant for the last five years. The growth rate of other categories of services (such as Business Process Outsourcing, Training and Other) is very low compared to software development.

6.5 Space Requirement of Bangladesh ICT Industry

For determining space requirement (sft/Tk m) of Bangladesh ICT Industry, the following two factors have been used:

a) Factor for Space Requirement per Person (SRP) - (sft/person)

b) Revenue Earning Factor (REF) - (Tk. m/person)

$$\text{Space Requirement (sft/Tk.m)} = \frac{\text{SRP(sft/person)}}{\text{REF (Tk. m/person)}}$$

6.5.1 Space Requirement Factor (SRP) - (sft/person)

The data for space requirement (sft) vs no of employee and revenue (Tk.m) vs no of employee of sample ICT companies for the four different categories were plotted on XY charts. The SRF (sft/person) for determining space of ICT industry have been derived based on the following best-fit lines.

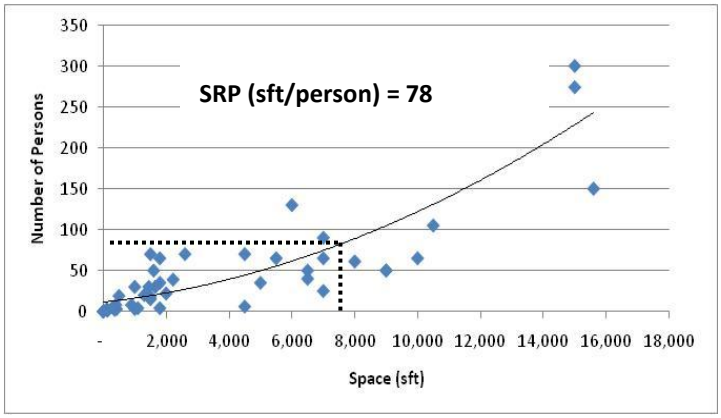


Figure 1: SRP (sft/person) for Software Development

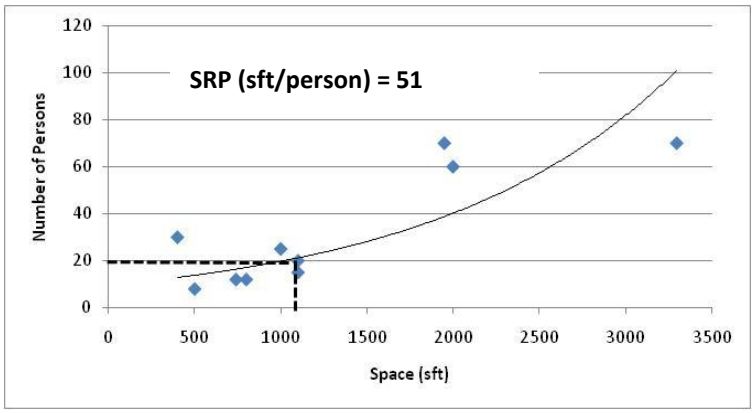


Figure 2: SRP (sft/person) for BPO

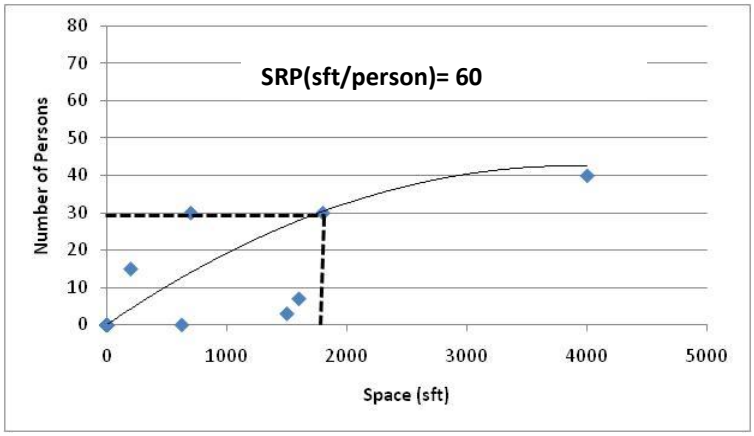


Figure 3: SRP (sft/person) for Training

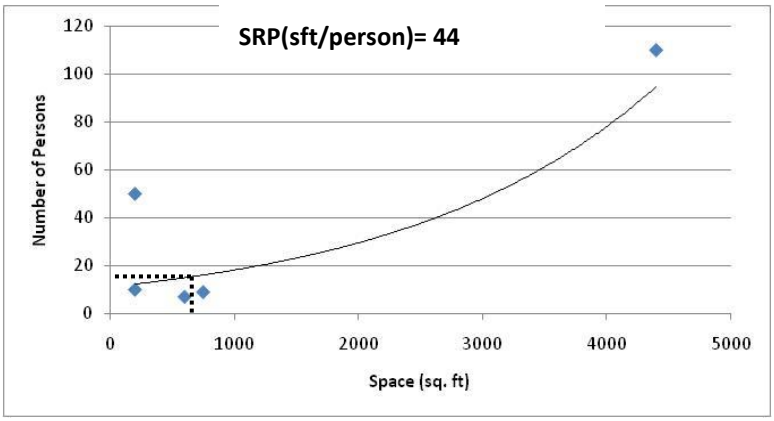


Figure 4: SRP (sft/person) for Other

The factor SRP (sft/person) for the above different categories of businesses has been derived from the dotted lines that represent the most representative points. It can be concluded from the above figures that number of persons and space moves in close pace with each other. There is a positive relationship between each other.

In software development companies, space requirement (sft) depends on the number of employees working in a company. There is a positive relationship between space required and number of persons. Space requirement for software development tends to go up with the number of persons working in a company.

For business process outsourcing, space (sft) requirement depends on the number of persons working in companies. There is a positive relationship between space required and number of persons. Space requirement tends to go up with the number of persons.

The space required for training program depends on the number of participants. The amount of space required tends to go up with number of

persons. The relationship between the number of persons and space is positive.

The space required for others (customized software, web development, and database support) depends on the number of persons. The amount of space required tends to go up with number of persons. The relationship between the number of persons and space is positive.

6.5.2 Revenue Earning Factor (REF) (Tk. m/person)

The REF (Tk. m/person) for determining space requirements have been derived based on the following best-fit lines.

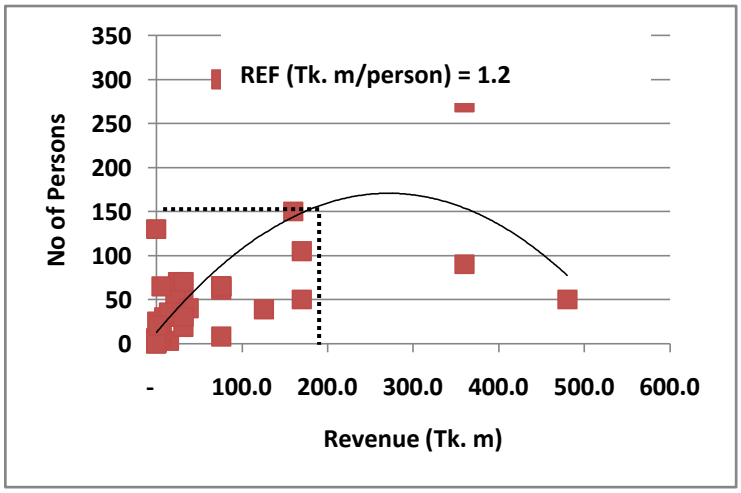


Figure 1: REF (Tk. m/person) for Software Development

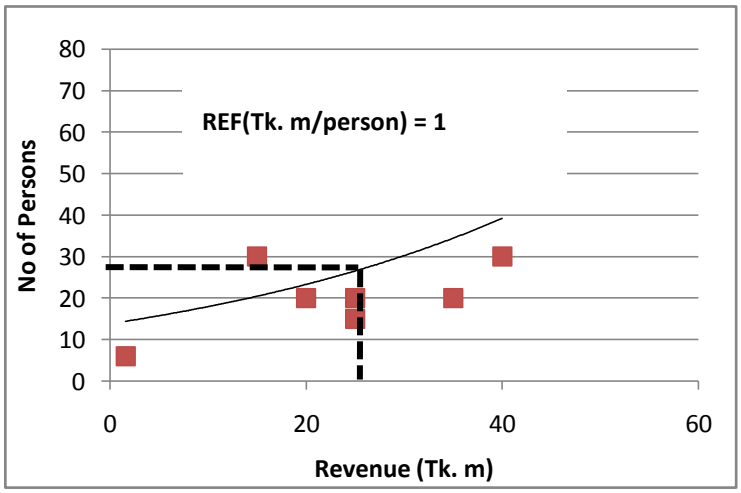


Figure 2: REF (Tk. m/person) for BPO

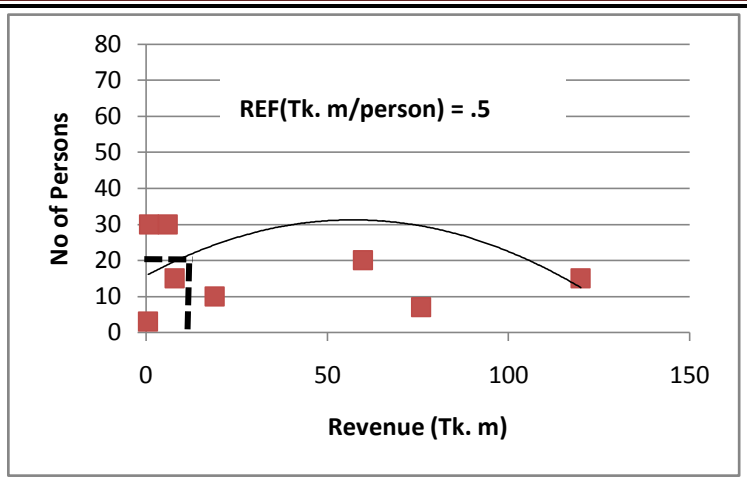


Figure 3: REF (Tk. m/person) for Training

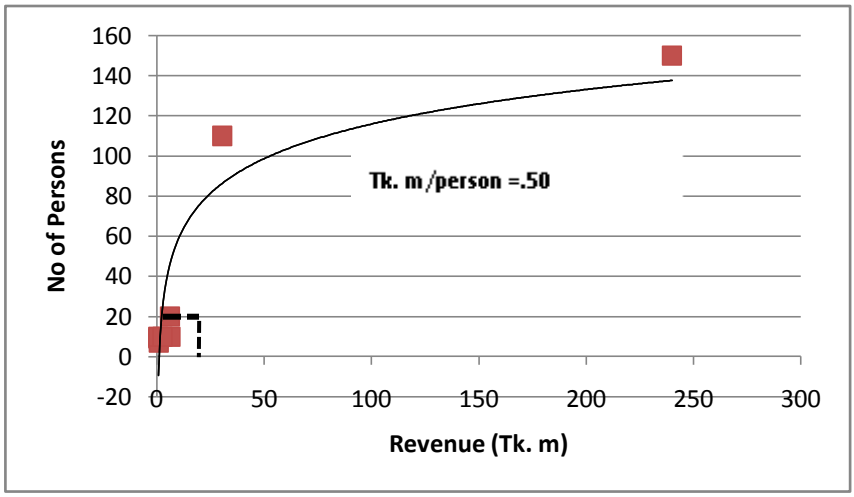


Figure 4: REF (Tk. m/person) for Other

The factor REF (Tk.m/person) for the four different categories of businesses has been derived from the dotted lines that represent the most representative points.

For software development, the relationship between revenue and number of persons are not dependent on each other. Revenue depends on the nature of the business. It is found that the relationship between number of persons and revenue is negative.

For business process outsourcing, revenue depends on the number of persons working in companies. The relationship between number of persons and revenue is positive.

For training program the relationship between revenue and number of persons is positive. Revenue earned from the training programme is depended on number persons.

For others (customized software, web development, and database support) the relationship between number of persons and revenue is negative.

Therefore the space requirements (sft /Tk m) of Bangladesh ICT Industry are as follows:

Table 6.2: Space Requirement of Bangladesh ICT Industry

Category of Services	SRP(sft/person)	REF (Tk. m/person)	Space Requirement (sft /Tk m)
1. Software Development	78	1.27	61
2. BPO	51	1.00	57
3. Training	60	0.50	120
4. Others	44	0.50	89

6.6 Employment Generation of Bangladesh ICT Industry

The employment generation of ICT industry has been derived from the following two factors:

a) Factor for Space Requirement per Person (SRP) - (sft/person)

b) Factor for Space Requirement per Tk. m (SRT) - (sft/Tk m)

$$\text{Employment generation (person/Tk.m)} = \frac{\text{SRP (sft/person)}}{\text{SRT (sft/Tk m)}}$$

Therefore, the employment generation (person/Tk. m) of different category of services of Bangladesh ICT industry is as follows:

Table 6.3: Employment Generation of Bangladesh ICT Industry

	Category of Services	SRP (sft/person)	SRT (sft /Tk m)	Employment Generation (person/Tk m)
1.	Software Development	78	61	0.79
2.	BPO	51	57	1.12
3.	ICT Training	60	120	2.00
4.	Others	44	89	2.00

6.7 Bandwidth requirement of Bangladesh ICT Industry

For determining bandwidth requirement (Mbps /Tk m) of Bangladesh ICT Industry, the following two factors have been used:

a) Bandwidth Capacity Factor (BCF) -(Mbps/person)

b) Revenue Earning Factor (REF) - (Tk. m/person)

$$\text{Bandwidth Requirement (Mbps/Tk.m)} = \frac{\text{BCF (Mbps/person)}}{\text{REF (Tk. m/person)}}$$

6.7.1 Bandwidth Capacity Factor (BCF) - (Mbps/person)

The data for bandwidth (Mbps) vs number of persons of sample ICT companies for the four different categories were plotted on XY charts. BCF (Mbps/person) for determining Bandwidth requirement have been derived based on the following best-fit lines.

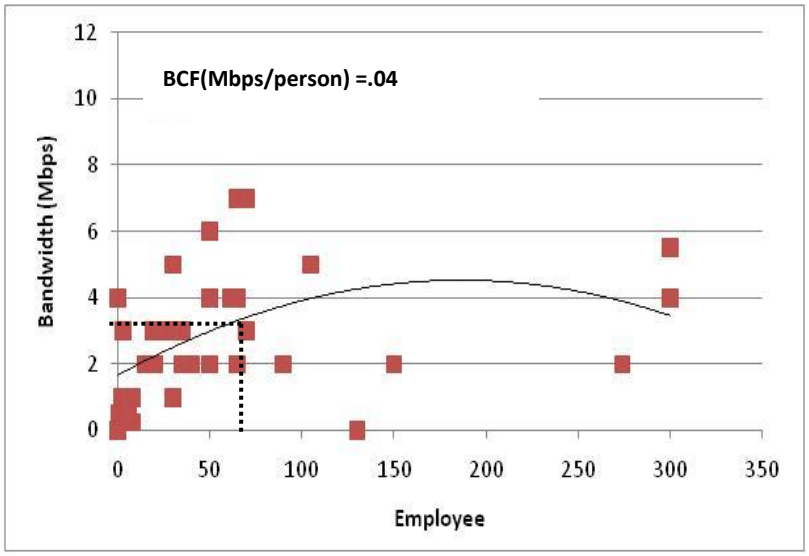


Figure 1: BCF(Mbps/person) for Software Development

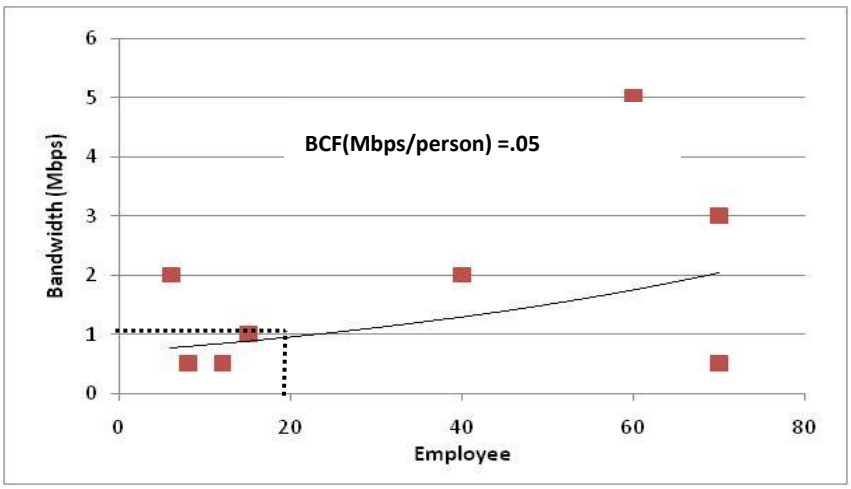


Figure 2: BCF(Mbps/person) for BPO

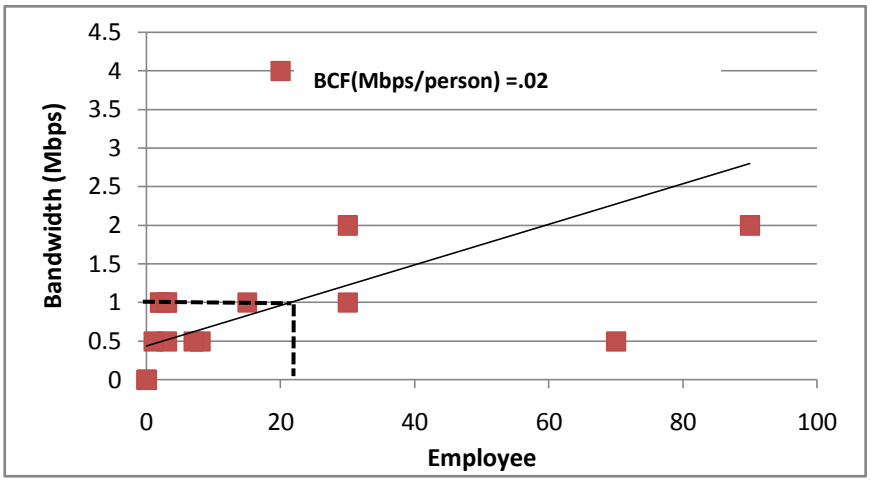


Figure 3: BCF(Mbps/person) for Training

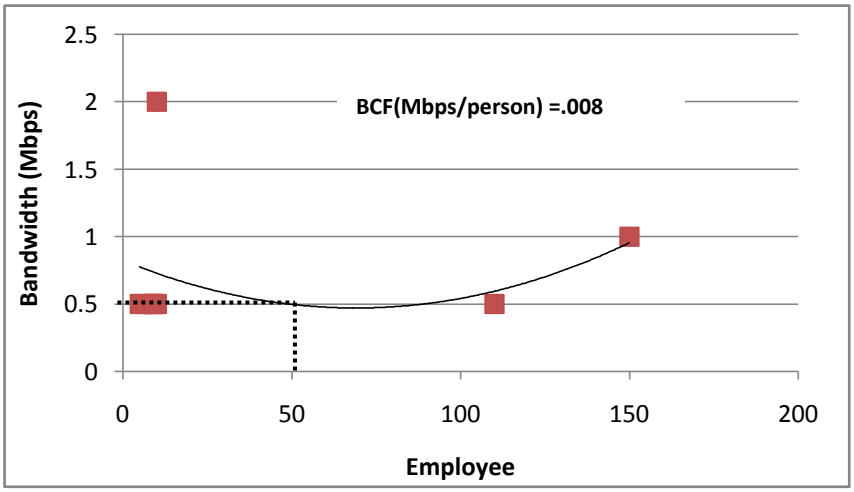


Figure 4: BCF(Mbps/person) for Other

The factor BCF (Mbps/person) for the above different categories of businesses has been derived from the dotted lines that represent the most representative points.

For software development, bandwidth needed depends on number of employees in a company. The relationship between employees and bandwidth is positive. The requirement of bandwidth tends to move up with number of employees.

For Business Process Outsourcing required bandwidth depends on the number of employees. The relationship between bandwidth and employees is positive. Bandwidth tends to move up along with the number of employees.

For training programme required bandwidth depends on the number of employees. The relationship between employees and bandwidth is positive.

Bandwidth tends to move up along with the number of both employees and trainees.

For other businesses (customized software, web development, and database support) the required bandwidth depends on the number of employees. The relationship between employees and bandwidth is positive. Bandwidth tends to move up along with the number of employees.

Therefore the bandwidth requirements (Mbps/Tk m) of different category of services of Bangladesh ICT industry are as follows:

Table 6.4: Bandwidth Requirement of Bangladesh ICT Industry

	Category of Services	BCF(Mbps/ person)	REF (Tk. m /person)	Bandwidth (Mbps/ Tk m)
1.	Software Development	.04	1.27	0.03
2.	BPO	.05	1.00	0.06
3.	Training	.02	0.50	0.04
4.	Others	.008	0.50	0.02

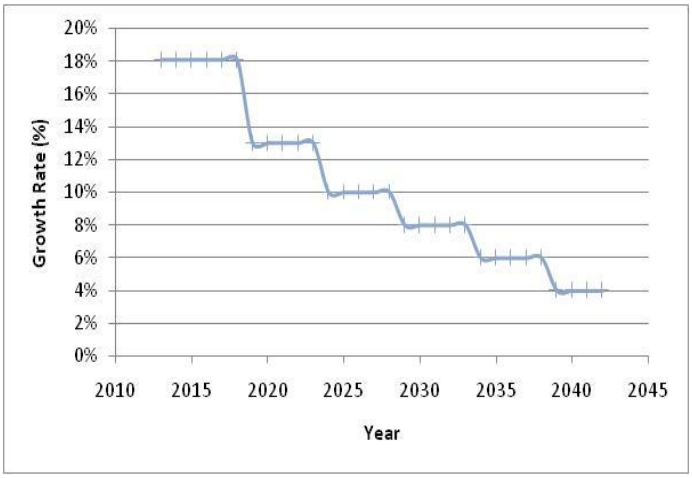
6.8 Projection of Growth Rates of Bangladesh ICT Industry

Bangladesh has identified ICT as a "thrust sector" as it represents potential for successful reforms, job creation, industry growth and high spillover effects to other sectors as well as improving governance and facilitating inclusion. From the last four years historical data, average growth rate of different category of business are determined. The growth rate of different category of businesses will be forecasted based on their respective average growth rates.

6.8.1 Growth Projection of Software Development

Software development has become a growing industry in Bangladesh over the last two decades. The industry has become dynamic with a significant number of energetic entrepreneurs making their mark. The software industry in this country has started rapidly growing in recent years. This optimistic growth is supported by good software export trends and large demand for automation of manual processes in domestic market.

Figure 6.2: Projection of Growth Rate of Software Development

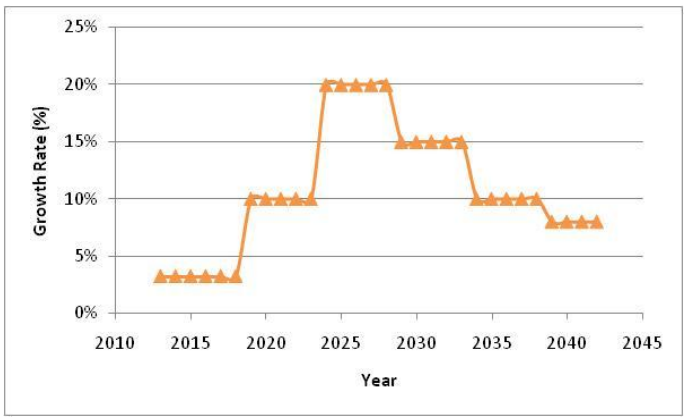


Average growth rate of software development is determined as 18% from the sample industry (68 surveyed companies). It is assumed that the rate will remain constant for the first five years block. For the 2nd five year block, it will slightly decreases to 13%. For 3rd block, the growth rate will be 10%. For last 3 blocks, the growth rate will be 8%, 6% and 5% in software industry.

6.8.2 Growth Projection of Business Process Outsourcing

Business Process Outsourcing (BPO) is a form of outsourcing that involves the contracting of the operations and responsibilities of a specific business functions (or processes) to a third-party service provider. In recent years there has been a move towards Business Process Outsourcing also – a trend which will further strengthen with enhanced connectivity and bandwidth.

Figure 6.3: Projection of Growth Rate of BPO

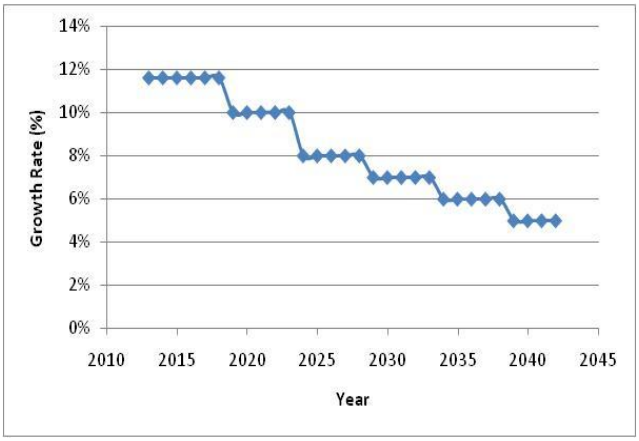


Average growth rate of BPO is determined as 3% from the sample industry. Initially the growth rate is low because this category of business is new for the ICT industry. The market for the BPO industry has started booming. Therefore, the demand for BPO will increase over a period of time.

6.8.3 Growth Projection of Training

The training institutes are concentrating their efforts on software development and providing training on basic and advanced computing skills. In recent times, with the growth of the ICT training sector, availability of skilled people has been enhanced.

Figure 6.4: Projection of Growth Rate of Training



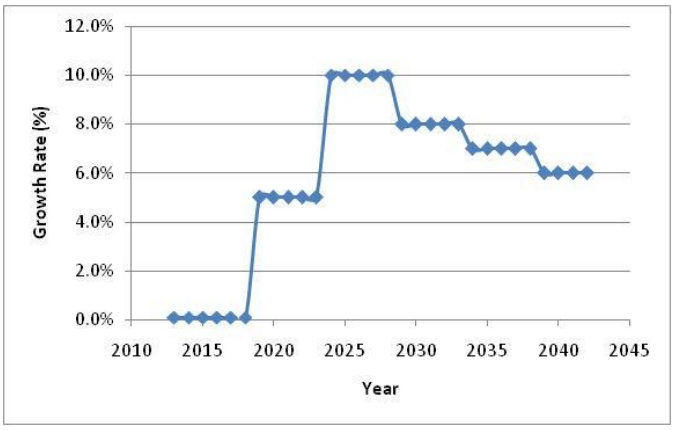
Average growth rate of Training is determined as 12% from the sample industry. It is assumed that the rate will remain constant for the first five years. For 2nd five year block, it will slightly decrease to 10%. For last four blocks, the growth rate will gradually decrease to 8%, 7%, 6% and 5% respectively.

Table 6.5 : Growth Projection of Bangladesh ICT Industry

Category of Services	Growth Rate (%)					
	0-5yrs	6-10 yrs	11-15 yrs	16-20 yrs	21-25 yrs	26-30 yrs
1. Software Development	18%	13%	10%	8%	6%	4%
2. BPO	3%	10%	20%	15%	10%	8%
3. Training	12%	10%	8%	7%	6%	5%
4. Others	0.10 %	5%	10%	8%	7%	6%

6.8.4 Growth Projection of Other

In ICT industry apart from software, BPO and training, there are some other businesses which include web development, customized software, support service (Oracle Database Support), hardware assembly etc. Though this category of businesses started from a very low base, they will be growing rapidly in future. Average growth rate of the last type business is determined as .10% from the sample industry. It is assumed that for the second and third blocks, the growth rate will



gradually increase to 5% and 10% respectively. For the last three blocks, the growth rate will decrease to 8%, 7% and 6%.

6.9 General Assumption

The following broad assumptions were made in the study:

(1) The proposed ICT village will be located at Mohakhali

(2) Four different category of businesses are carried out on the proposed ICT village; (a) Software Development and Services, (b) BPO, (c) Training, (d)Other

(3) Average growth rate of the above four categories are considered as 18%, 3%, 12% and 0.1% respectively. The average growth rates are calculated based on sample companies in ICT industry.

(4) The market size of Bangladesh ICT Industry is USD 800 million. (BASIS survey).

(5) Demand for Dhaka ICT industry is considered as 82% of Bangladesh ICT Industry.

(6) Allocation of demand for Mohakhali ICT village is considered as 85% of Dhaka ICT Industry.

(7) Percentage of space requirement for different category of businesses are as follows:

(a)Software Development	(b) BPO	(c) Training	(d) Other
68%	25%	2%	5%

(8) Consider the three forecast scenarios; base case, optimistic case and conservative case

(9) Determine the forecast growth rates for different scenarios

(10) Generate the demand for space requirement, bandwidth requirement and employment generation of Mohakhali ICT village under three forecast scenarios for a period of thirty years.

6.10 Forecast Scenarios

The demand forecast was developed under the following three scenarios with the following levels of occupancies.

The base case scenario reflects the most likely business conditions. It presumes the general assumptions outlined in the previous sections. In optimistic case, a more favorable growth rates are assumed for industry volume of ICT village. The demand projection of Mohakhali ICT village under base case, optimistic case and conservative case are attached in Annex H.

The total leasable area of Mohakhali ICT village is 985,600 sft for MTB No 1. Based on the demand forecast in different scenarios, the occupancy rates in different scenarios will be assumed.

Table 6.6: Space take up for MTB No 1 in different scenarios

Scenarios	Space Requirement (sft) of Mohakhali ICT Village for MTB No 1						
	Y1	Y2	Y3	Y4	Y5	Y6	Y7
Base Case	797,917	894,648	1,003,369	-			
Optimistic Case	956,633	1,101,160	-	-			
Conservative Case	791,963	859,123	932,640	1,013,136			

The above table shows that, the demand for space of 985,600 sft will be filled up within 3 years in base case, 2 years in optimistic case and 4 years in conservative case.

Overall rate of occupation within Dhaka, where the ICT village have been opened, and developed in an orderly/timely fashion seems to indicate that 100% take up appears to be achieved within two (2) years. Given the overall demand, a three (3) years take-up would seem to be realistic.

The survey indicates that the ICT village will be fully taken up within longest four (4) years from start of operation in the conservative case, while it is most likely to be filled up within three (3) years in the base case. The new occupancy rates assumed in three cases are provided in the following table:

Table 6.7: Occupancy Rates in Different Scenarios

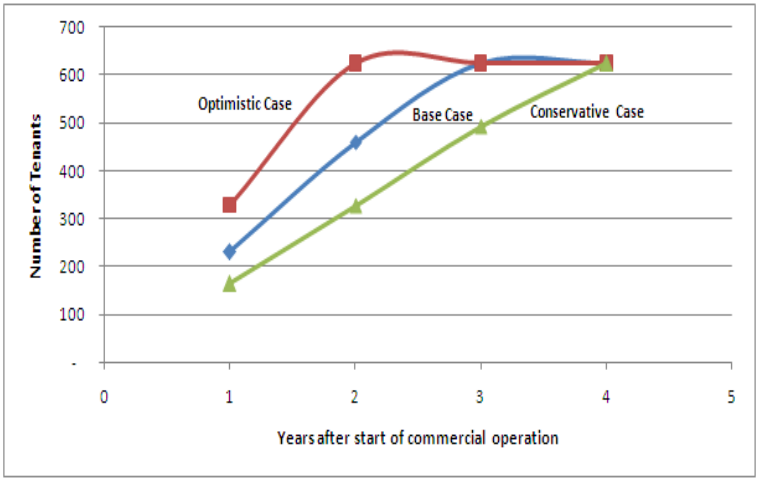
	New Occupancies		
	Base Case	**Optimistic Case**	**Conservative Case**
yr1	35%	50%	25%
yr2	35%	45%	25%
yr3	25%	-	25%
yr4	-	-	20%
Total	**95%**	**95%**	**95%**

It is assumed that balance 5% of the space will not be occupied most of the time due to changing tenants.

Forecasts were made for different scenarios to estimate the number of tenants of MTB in each sub-category. The number of tenants in each sub-category that was forecasted was then summed up.

The following figure illustrates the number of tenants likely to be located in the ICT village in the three scenarios.

Figure 6.5: Potential Number of Tenants of MTB No 1 in Different Scenarios



The following table provides a forecast of number of tenants expected in the village over the years, in base case. The demand forecast of other two scenarios has been laid out in Annex H.

Table 6.8: Demand Forecast (Base Case)

Annual Number of Units taken up in MTB No 1

Category of Services	*Standard Space Requirement*	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	*Cumulative Total*
Software Development	1,500	157	157	112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	426
BPO	1,500	57	57	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156
Training	1,500	5	5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Other	1,500	10	10	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Total Forecasted New Tenants		**230**	**230**	**164**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**624**
Cumulative Total Forecasted New Tenants		**230**	**460**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**

On the other hand, the total leasable area of Mohakhali ICT village is 985,600 sft for MTB No 2. Based on the demand forecast in Different scenarios, the occupancy rates in different scenarios will be assumed.

Table 6.9: Space take up for MTB No 2 in different scenarios

Scenarios	Space Requirement (sft) of Mohakhali ICT Village for MTB No 2												
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13
Base Case	-	1,125,584	1,262,990	1,404,159	1,562,582	1,740,625	1,941,019	-	-	-	-	-	-
Optimistic Case	1,267,842	1,460,109	1,681,926	1,920,801	-	-	-	-	-	-	-	-	-
Conservative Case	-	-	1,101,294	1,174,764	1,253,197	1,336,930	1,426,324	1,521,767	1,597,100	1,676,171	1,759,163	1,846,272	1,937,703

The above table shows that, the demand for space of 1,971,200 sft will be filled up within 7 years in base case, 4 years in optimistic case and 13 years in conservative case.

The new occupancy rates assumed in three cases are provided in the following table:

Table 6.10: Occupancy Rates in Different Scenarios

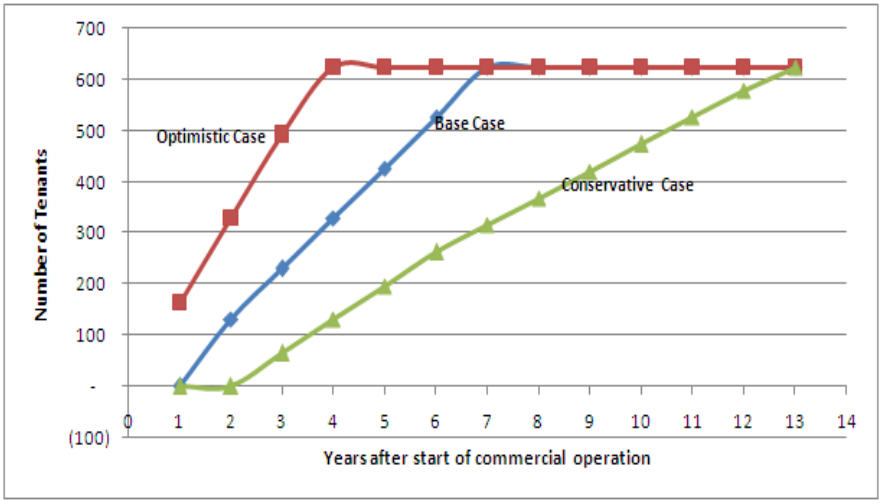
	New Occupancies		
	Base Case	**Optimistic Case**	**Conservative Case**
yr1	0%	25%	0%
yr2	20%	25%	0%
yr3	15%	25%	10%
yr4	15%	20%	10%
yr5	15%	-	10%
yr6	15%	-	10%
yr7	15%	-	8%
yr8	-	-	8%
yr9	-	-	8%
yr10	-	-	8%
yr11	-	-	8%
yr12	-	-	8%
yr13	-	-	7%
Total	**95%**	**95%**	**95%**

It is assumed that balance 5% of the space will not be occupied most of the time due to changing tenants.

Forecasts were made for different scenarios to estimate the number of tenants of MTB in each sub-category. The number of tenants in each sub-category that was forecasted was then summed up.

The following figure illustrates the number of tenants likely to be located in the ICT village in the three scenarios.

Figure 6.6: Potential Number of Tenants of MTB No 2 in Different Scenarios



The following table provides a forecast of number of tenants expected in the village over the years, in base case. The demand forecast of other two scenarios has been laid out in Annex F.

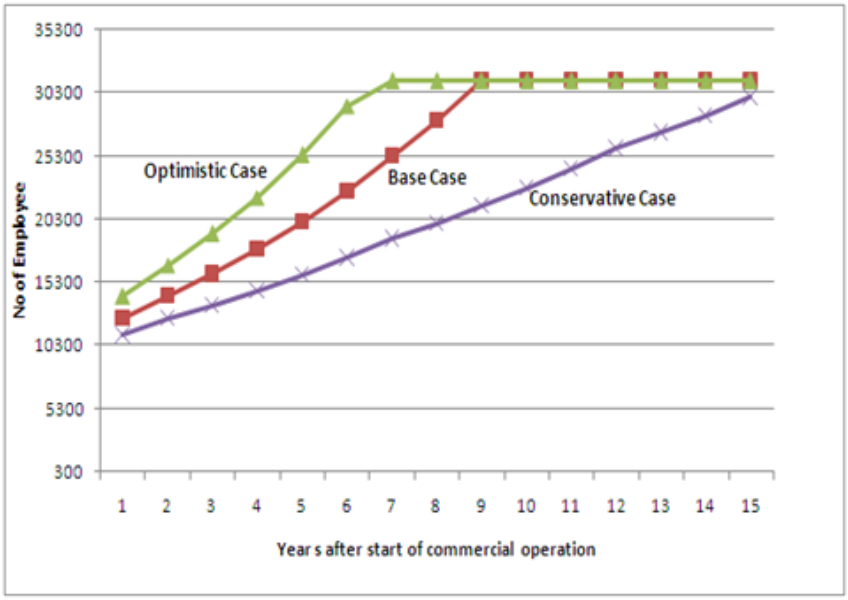
Table 6.11: Demand Forecast (Base Case)

Annual Number of Units taken up in MTB No 2

Category of Services	*Standard Space Requirement*	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	*Cumulative Total*
Software Development	1,500	-	90	67	67	67	67	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	426
BPO	1,500	-	33	25	25	25	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156
Training	1,500	-	3	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Other	1,500	-	6	4	4	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Total Forecasted New Tenants		**-**	**131**	**99**	**99**	**99**	**99**	**99**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**624**
Cumulative Total Forecasted New Tenants		**-**	**131**	**230**	**329**	**427**	**526**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**	**624**

The ICT village will generate significant employment for Dhaka. Most of the new employment will arise from investments that would not have otherwise been made without the existence of the village. The following figure provides a profile of potential employment generation.

Figure 6.7: Potential Employment Generation through MTBs



In base case, employment for 30,000 individuals has exceeded in 9th year of operation; in optimistic case this has been realized in 6th year; and in conservative case this has been realized in 15th year. Of the three cases considered, base case is the most likely scenario. Considering these three scenarios, there is a demand for approximately 30,000 individuals in both MTBs of Mohakhali ICT village.

6.11 Utility Forecast

The ICT village will be designed to provide necessary utilities for the tenants without interruptions in services. This means that every tenant will have access to good and uninterrupted internet connectivity. In the absence of functioning utilities, the demand forecast presented in this report may not work at all.

The following table provides estimated bandwidth requirement in the village in different scenarios:

Table 6.12: Yearly Bandwidth Requirement

Bandwidth Requirement (Mbps)										
Scenarios	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Base Case	329	369	413	464	520	578	644	717	800	800
Optimistic Case	394	454	522	602	693	791	791	791	791	791
Conservative Case	326	354	384	417	454	484	516	551	588	627

7

Technical Planning and Design

7 TECHNICAL PLANNING AND DESIGN

7.1 Introduction

The Mohakhali ICT village will encourage development of Software technology industry in Bangladesh. This will be done primarily by the private sector entrepreneurs. The software entrepreneurs in Bangladesh are still in the embryonic state. While its adherents do not lack talent, there is deficit in training, skills, marketing and especially lack of capital to start.

The role of the public sector (government) is primarily to act as the catalyst and facilitator by providing physical facilities to the private sector, small and medium entrepreneurs, in software development technology. So the Govt. provides the support for the development and marketing and sales of software, through facilitating development of basic infrastructure for the industry.

Therefore, in this project space and facilities for software development takes priority. Most other spaces are there to support this activity. For the program purposes there will be two Multi Tenant Buildings (MTB) in the Mohakhali ICT village, where majority of floor area is provided for lease to private sector software development companies and other ICT related entrepreneurs.

It is one of the significant endeavours of Government of People's Republic of Bangladesh (GOB) to expedite the deployment of digital technology and software development it is primarily geared to the digital technology by the private sector with active assistance of the Public Sector (GOB). The determination of GOB is to expand the horizon of digital technology and the expansion of the software technology market by Bangladesh. The Mohakhali ICT village thus should be a forward looking and future technology buildings. The functions and images should reflect this.

7.2 Site Location

The proposed site for the development of Mohakhali ICT village is located at:

Mouza:	Karail
J.L.:	276
Dag nos.:	38, 39, 43, 50, 61, 64, 65, 66, 67, 68, 69, 70, 71
Thana:	Banani (present)
Ward:	19, Dhaka City Corporation-North
District:	Dhaka

The site is surrounded by Banani Lake beside the Bir Uttam AK Khandakar Road. It is bounded by the land and water as mentioned below:

- North: towards Banani Road no. 5 (extension)
- South: Mohakhali BRAC Center (after Lake and Road)

- East: Gulshan-Banani Lake
- West: T&T Satellite

7.3 Land Ownership

The land area of the proposed site for the development of the Mohakhali ICT village is approximately 47 acres. The site is a govt land, earlier belonging to Ministry of Post and Telegraph (MoPT). The land has been legally transferred to the Bangladesh Hi-tech Park Authority (BHTPA).

The site is situated in Karail village within the city. It is a chunk of govt. land, presently occupied by different people and is widely known as "Karail Slum". Total area of Karail area is of 110 acre land. The entire area was under ownership of MoPT. Present ownership of different pieces of this land is as follows.

1. Ministry of Post and Telecommunications (MoPT), 20 acres, occupied by 3rd & 4th class employees housing of T&T department in pucca buildings, along with some slum type structures.
2. Public Works Department (PWD), 43 acres, 30 acres in this area is proposed for construction of 40,000 flats for government officers.
3. Bangladesh High Tech Park Authority (BHTPA), on behalf of Ministry of Information and Communications Technology (MoICT), 47 acres, presently occupied by NDBUS members living in slum conditions.

7.4 Site Access

The project site is situated just beside the Mohakhali-Gulshan road, crossing the lake at the bridge over the lake near BRAC Inn building. Present accessibility to site from this point is by boat only. A road bridge is proposed to be constructed at this point across the lake for easy access to the site from main road.

Present road connection to the site is at two points from the following three roads:

1. From Banani Road no. 5 (extension) through T&T staff quarters.
2. From Banani Road no. 8 /Road no 1 (extension, up to Wireless junction at Mohakhali-Gulshan road) via Adel road crossing the lake, through T&T land.
3. From Mohakhali-Gulshan road, at Wireless junction to site via Adel road crossing the lake, through T&T land.

7.5 Land Development

The land at site is relatively high and does not need much land-filling. However, at the present boat ghat some land has been eroded in shape of crescent. This is to be developed and filled through earth-filling by dredged spoil. Also, all along the lake shore, bank protection and shore demarcation

is to be done by suitable shore–piling, by timber bullah or steel sheets. The details are to be designed at the time of implementation. Some quantity of earth filling along the shore will be required to bring the entire land to one level.

7.6 Zone-wise Land Allocation

The total project area of is 47 acre, out of which 2.5 acre falls in water within the lake. The remaining 44.50 acre of land is divided into following 6 zones. This include the main road of 2 acre which is the central passing though the project land and is not in any zone. The following Table provides the land allocation of the project area for different zones.

Table 7.1: Zone-wise area distribution

Sl.	Zone	Zone Name	Area in acre
1	Zone-1	ICT Business zone	18.00
2	Zone-2	Hotel Business Zone	3.25
3	Zone-3	Convention & Training Centers	2.00
4	Zone-4	Residential Zone	16.50
5	Zone-5	Recreational Zone	1.00
6	Zone-6	Administrative Zone	1.75
		Land in central road	2.00
		TOTAL Land	44.50

7.7 Proposed Project Facilities

The Mohakhali ICT village will include the following facilities.

- Administrative Building
- Multi Tenant Building, MTB, for ICT business
- The Dormitory Building and Residential Buildings
- Different Utility Connections like Electricity, Water, Gas, Internet facilities, etc.
- Common facilities like Parking areas, Playgrounds, Parks, open spaces, etc.
- Recreational zone, with boat club, Amphitheater, etc.
- Hotel business zone, for accommodation, cuisine and other health and recreational facilities for industry officials and incoming guests.

Suggested buildings in different zones are listed below. These are only indicative, and are to be finalised as per requirement of the time, by BHTPA

and the selected private sector or investor. The suggested buildings in the project area in different zones are given below.

1. ICT Business Zone
   i. Multi Tenant Building, MTB-1
   ii. Multi Tenant Building, MTB-2
2. Hotel Business Zone
   i. Five-Star Hotel Building 1
   ii. Five-Star Hotel Building-2
3. Convention & Training Centers
   i. Convention Center
   ii. Training Center-1
   iii. Training Centers-2
4. Residential Zone
   i. Dormitory Building -1
   ii. Dormitory Building -2
   iii. Residential Buildings-8 nos.
5. Recreational Zone
   i. Amphitheater
   ii. Boat Club Building
6. Administrative Zone
   i. Administrative Building
   ii. Gate House & Reception Building

7.8 Master Planning

A Master Plan for the proposed Mohakhali ICT village has been prepared to accommodate functional programs.

The following list gives the proposed buildings provided in the Masterplan, with floor area and number of floors of each building. Also number of buildings of each type is provided. It must be mentioned here that these all are only indicative. As this is a PPP project, these will be finalised as per requirement of the time, by BHTPA and the selected private sector investor.

Table 7.2: Buildings with areas in Project Master Plan

	Building	Floor area (sft)	No. of floors	No. of Bldgs.	Total area (sft)
1	Administrative Building	10,000	5	1	50,000
2	Gate House & Reception	3,000	2	1	6,000
3	Multi Tenant Buildings	50,000	30	2	3,000,000
4	Hotel Buildings	25,000	20	2	1,000,000
5	Training Centers	12,000	10	2	240,000

	Building	Floor area (sft)	No. of floors	No. of Bldgs.	Total area (sft)
6	Convention Center	15,000	3	1	45,000
7	Residential Buildings	25,000	8	8	1,600,00
8	Dormitory Buildings	6,000	6	2	72,000
9	Amphitheater	10,000	1	1	10,000
10	Boat Club	10,000	2	1	20,000

7.9 Zone-wise Construction Schedule

A tentative construction schedule of zone-wise construction is given below.

Table 7.3: Zone-wise construction schedule

Sl.	Zone	Buildings	Start date	Completion date
1.	Zone-1	ICT Business zone- MTB 1	Mar 2019	Mar 2022
2.	Zone-1	CT Business zone – MTB2	Mar 2021	Mar 2024
3.	Zone-2	Hotel Business Zone	Sep 2022	Oct 2025
4.	Zone-3	Convention & Training Centers	Mar 2020	Mar 2022
5.	Zone-4	Residential Zone	Sep 2021	Sep 2023
6.	Zone-5	Recreational Zone	Mar 2021	Mar 2022
7.	Zone-6	Administrative Zone	Jan 2019	Sep 2021

7.10 Options in Master Planning

For different types of resettlement /relocation options of Project Affected Persons (PAPs), 6 different options have been considered in the project planning. This has been described in detail in relevant section. In brief, the options are as follows:

1. Option I: Resettlement by GoB with Cash Compensation
2. Option II: Resettlement by PPP Investor with Cash Compensation
3. Option III: Off-site Resettlement in by PPP Investor
4. Option IV: Off-site Resettlement by PPP Investor, with Real Estate
5. Option V: On-site Resettlement by PPP Investor with Real Estate
6. Option VI: Resettlement of Entire Karail Area by PPP Investor

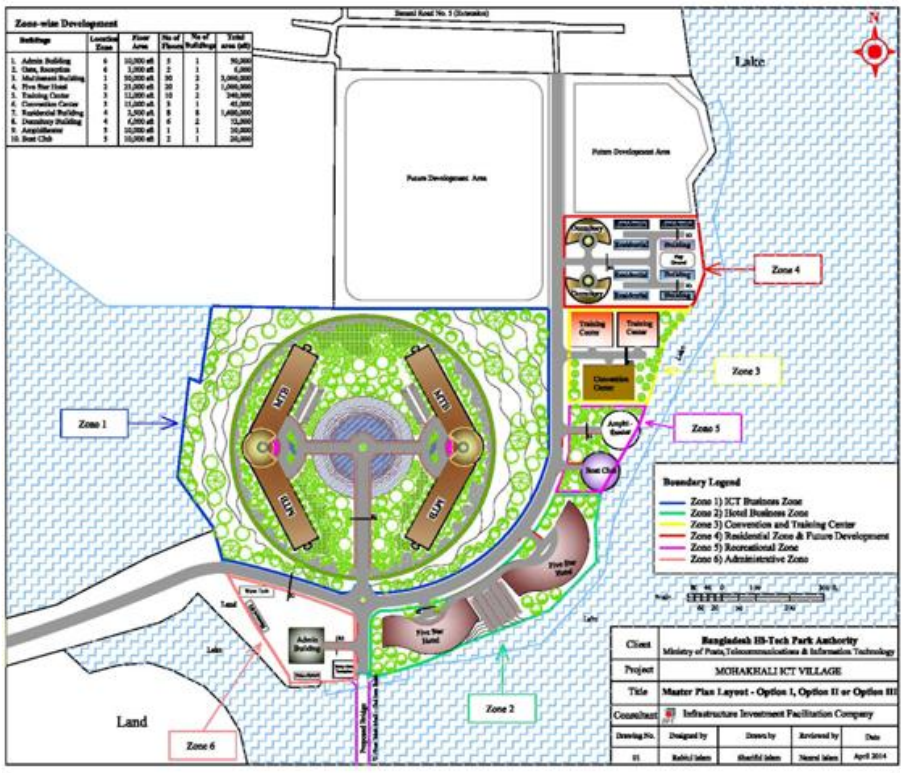
Considering different modes of resettlement of PAPs, 3 different project layout plans have been prepared for the Mohakhali ICT village site.

7.10.1 Layout -1 (For Options I, II and III)

In the options I, II, III and IV, the entire land of the project site (net 44.50 acre) will be used for ICT village development. The zone wise land allocation will be same as provided in Table 7.1.

For such case, the Layout 1 has been prepared.

Figure 7.1: Master Plan Layout 1 for Option I, Option II or Option III

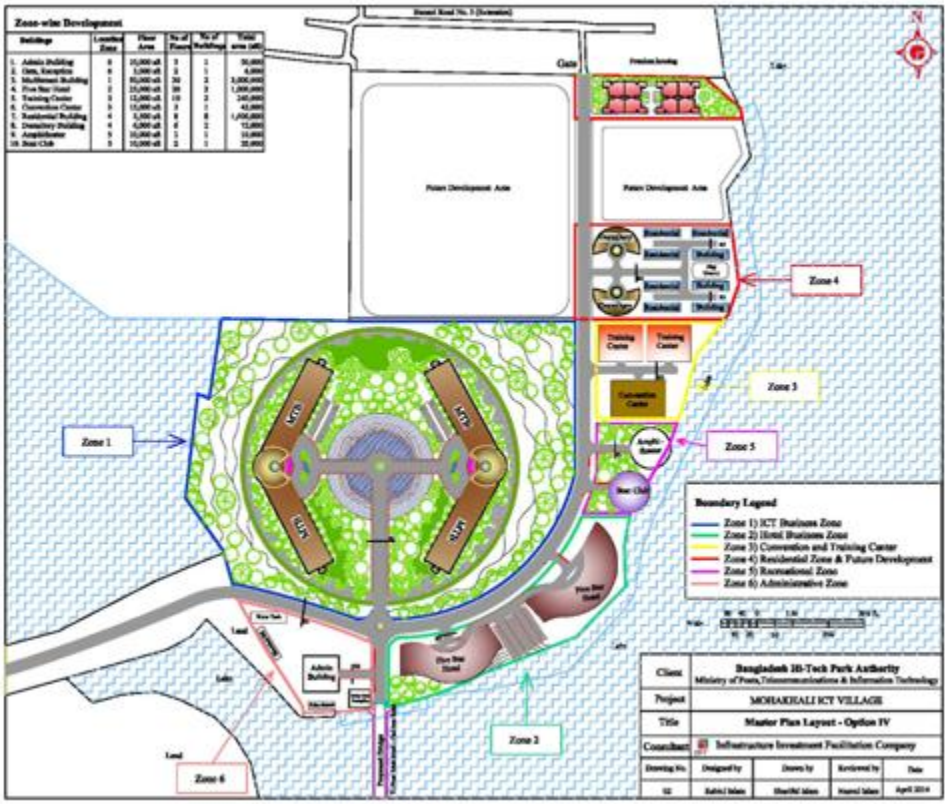


7.10.2 Layout -2 (For Option IV)

In this option the resettlement cost is to be borne by PPP Investor through real estate business. To offset the cost of construction of 1545 number of economy flats outside the project land for the PAPs, 2 buildings of Premium Housing will be built by the PPP Investor in the project land. BHTPA will allow 0.5 acre of land of the project site for this purpose. And total 44 acre of land will be available for the ICT Village.

For this case, the Layout 2 has been prepared, where half acre land has been provided for the Premium Housing. Other ICT project facilities will be similar to that of Layout 1.

Figure 7.2: Master Plan Layout 2 for Option IV



7.10.3 Layout -3: (For Option V)

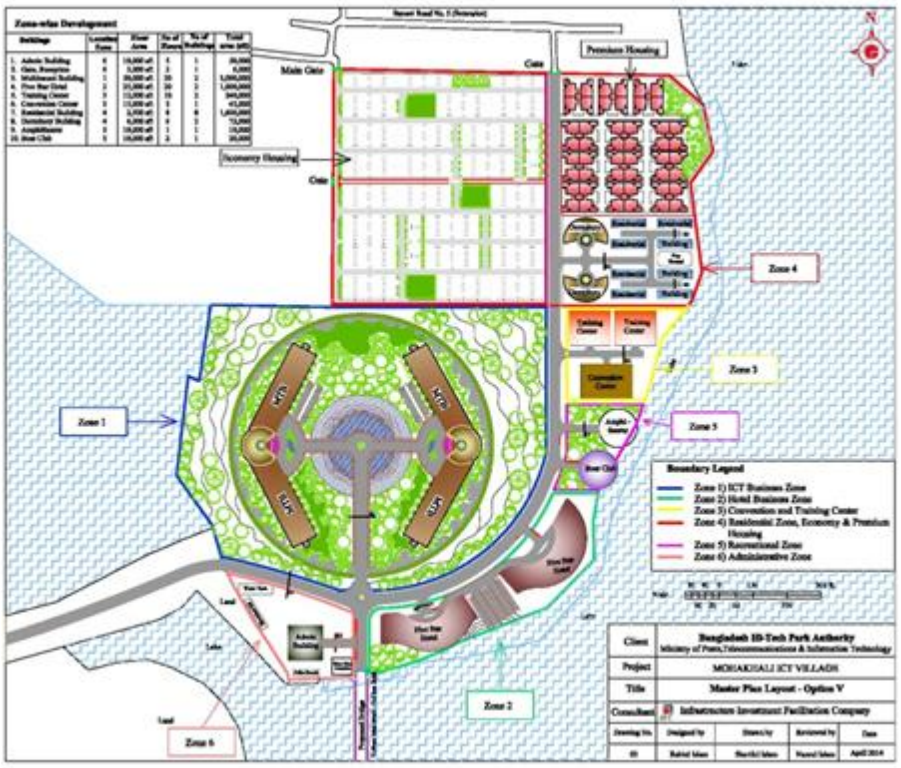
In this option, on-site resettlement of PAPs is provided in 47 nos. buildings in 'Economy Housing Enclave' within the project site. This will require an area of 9 acres, for construction of 6,768 economy flats in 47 Economy Housing buildings of 10 floors each. The cost of economy houses will be set-off by development of Real Estate of 480 nos. of Premium Apartments in 12 nos. 10 storied buildings, on an area of 4 acres. Therefore, in this option total 13 acre land will be used for resettlement of PAPs without any additional cost to the project. In addition, BHTPA will own 6.768 economy hoses free of project cost.

In this option, the ICT village will be constructed on an area of 31.50 acre land.

The Option VI needs more survey and study and is beyond scope of this report.

All the 3 layouts, for different resettlement options, have been provided in the Annex G of this report.

Figure 7.3: Master Plan Layout 3 for Option V



7.10.4 Space Calculations for Layout -3 (For Option V)

Calculations for Economy Housing

a)	No of economy houses (calculated)		6,693	units
b)	Net area per unit EH (15ft x 15 ft)		225	sft
c)	No. of Flats per floor		16	flats
d)	No. of residential floors per building		9	+ GF
e)	No of Flats per Building		144	
f)	Dimensions of 1 Building, having 16 flats per floor			
	* Length, =30+12+30+12+30+12+30		156	ft.
	* Width, =15+6+15		36	ft.
g)	Gross Plinth area for 1 Building		5,616	sft
h)	Plinth area for 1 Building in acre		0.13	acre
	Area conversion , sft/acre	43,560		
i)	Net Plinth are per building (minus open spaces)		5,166	
j)	No. of Buildings to be constructed		47	
k)	Total no flats		6,768	
l)	Total Ground area required for total buildings		6.06	acre
m)	Adding 50% open space, area required		9.09	acre
n)	Area provided in the Masterplan		9	**acre**

Calculation for Premium Houses

Assumptions:
In apartment developer model, owner gets 50% flats with land which is equivalent to cost of land plus flats of other 50%.
Here, both land is provided by BHTPA. Construction quality is half in EH.
So the developer shall get half of the Apartment area in PH (for selling).

a)	Total construction area of Economy Houses	2,428,020	sft
b)	Required area for Premium Houses (50%)	1,214,010	sft
c)	Floor area of one Apartment	2,500	sft
d)	No. of Apartments required	486	nos.
	Say	480	
e)	No. of residential floors per building	10	
f)	With 4 apartments/ floor, Area per floor	10,000	sft
g)	No. of apartments per building	40	
h)	No. of buildings required	12	
i)	Total plinth area required for all buildings	120,000	sft
		2.75	Acre
j)	Adding 45% open space, area required	3.99	Acre
k)	Area provided in the Master plan	**4**	Acre

7.11 Project Development by PPP

It is envisaged that the project will be developed in PPP model. The development will be shared by both public and private sectors.

Basic demarcation of activities by two parties will be that the public sector (GoB) agency, BHTPA will develop the site, make it accessible and will provide basic utility services, i.e. the outside infrastructures like electricity, internet connection facilities, gas, etc. It will also construct some buildings administrative zone. Some social buildings, such as mosques, school, hospitals, etc. are also to be implemented by the government sector.

The private sector will develop the ICT and other zones, as per requirement and operate those. All the buildings and installations in other zones are to be developed by private sector investors, through PPP contract agreement.

7.12 Civil Structures and other Installations

Brief descriptions of the developments and floor space occupations are given below.

1. **Multi Tenant Building, MTB** (The Mohakhali ICT Tower)

This is a boomerang-size of RCC and steel frame structure. It is a commercial building of total 50,000 sft plinth area, having 3 Blocks. The Block-A and Block-B are office spaces, connected by a third Block-C, which contains utility installations, such as reception, foyer, lobby, lift, stairs, escalator, washrooms and toilets, large open area for display and exhibition, etc.

It may be mentioned here that the size and design of the building is only an indicative one. In a PPP project, the investor may modify the design according to their requirement with approval of the counterpart agency.

In the master plan, 2 Multi Tenant buildings having 50,000 sft in each floor, has been provided. Each building will be 30 storied high. Total floor area of 2 MTB will be 3,000,000 sft.

The MTB will accommodate the following facilities:

i. Reception, Lobby Foyer Areas
ii. Administration Area
iii. Commercial Banks
iv. Food Courts and Food Vender stalls
v. Software Development Area
vi. Research & Development (R & D) Area
vii. Call Centers
viii. Training Area
ix. Meeting rooms
x. Conference and workshops and seminar hall
xi. Mechanical Services Area
xii. Core Service Areas (including 2 Lifts, one escalator, 2 stair halls, washrooms, 2 additional lifts for fire escapes, etc)

2. The Dormitory Building

This is a 6 storied RCC structure 6,000 sft dormitory building, of three-star standard. This will have a total floor area of 72,000 sft. in 2 buildings. This will provide suitable single accommodation for the workforce of ICT village.

The building will accommodate the following facilities:

i. Reception, Foyer, lounge, lobby
ii. Administration etc
iii. Bedroom or Hostel suits
iv. Kitchen
v. Dinning
vi. Gymnasium
vii. Laundry
viii. Other Utilities

3. The Residential Buildings

These are 8 storied RCC structure residential buildings. Total 8 separate buildings of 100' x 25' plinth area are provided. Each building will give a floor area of 20,000 sft. in 8 floors. The 8 buildings will give a total floor area of

160,000 sft. These buildings will provide family accommodation for officials working in the Mohakhali ICT village.

4. Hotel Business Zone

In this zone two nos. five-star standard hotel buildings, each having a floor area of 500,000 sft is provided. These hotels will run on commercial basis. These will cater for need of national and international guests.

Details of this zone will be prepared by the selected investor, as per demand of the time and norm of the industry.

5. Institutional Zone

In this zone two nos. Training Center buildings and one Convention Center is provided. These centers will cater for training and meeting needs of national and international institutions.

Details of this zone will be prepared by the selected investor, as per demand of the time and norm of the industry.

6. Recreational Zone

In this zone one Amphitheater and one Boat Club is provided, on the bank of Gulshan Lake. This zone will cater for recreational demand of national and international users.

Details of this recreational zone will be prepared by the selected investor, as per demand of the time and norm of the industry.

7. Administrative Zone

It is expected that the government will make some developments in the Mohakhali ICT village. The Administrative Buildings will be constructed by BHTPA. For this a separate zone is kept in the Master Plan Layout. This zone will also accommodate Entry Gate and Reception Building, police/ guard accommodation barracks, under-ground water reservoirs and other utility installations and fittings.

8. Site development and Utility Buildings

Other utility constructions in the project area, to be undertaken by BHTPA, will include:

- Site development and improvement
- Bank and lake-shore protection
- External Boundary walls
- Internal roads and footpaths
- Internal drains
- Substation and Generator building
- Deep Tube-wells, pumps and Water Reservoirs

- Parks, Playgrounds and Green areas
- Security Guard's Barrack
- Connecting bridge (from main road to site, over the Lake)

9. Internal Roads for ICT Village

For the ICT village, three different types of internal roads are planned. The major roads will be 30 ft wide; the secondary roads will be 30 ft. wide while the tertiary roads will be 20 ft. wide.

A sketch has been provided with this report for tentative design of these roads. However, these designs are subject to further detailing and changes, as required.

10. On-site Utility Installations

These will include the following.

- Substation and Generator building
- Site internal electric linings
- Deep Tube-wells, pumps and Water Reservoirs
- Water-supply distribution network
- On-site sewerage treatment Septic Tanks

11. Off-site Utility Installations

Off-Site infrastructures for the project will include the following and facilities will be provided as required.

- Power Supply Connection
- Optic Fiber Optics Connection
- Gas connection
- other utility services and facilities

12. Future Expansion of ICT Village

Some vacant land is available at the site for expansion of the project by GoB. In this reserved space GoB may construct some buildings of their own design, for further expansion of ICT facilities in the region. The developments in this area will be decided and implemented by the BHTPA. The developments may include the following technical, institutional, utility or social units.

i) ICT business Incubator
ii) Clinic and School
iii) Mosque
iv) Indoor/Outdoor Game Facilities
v) Integrated Waste Management Plant

7.13 Space Allocation of Functional Areas

The following Table gives a tentative space allocation or floor area distribution of the Multi-tenant Building.

Table 7.4: MTB Floors Distribution Table

Space use	Location Block	No. of Floors	Floor area (sft)	Remarks
Core Business				73%
BPO (Call Centers)	A, B	5.5	246,400	
Other ICT Units	A, B	1	44,800	
Training Centers	B	0.5	22,400	
Software Development Area	A, B	15	672,000	
Sub total			**985,600**	
Non-Core Business				17%
Banks	A, B	1	44,800	
Data Centre	A, B	2	89,600	
Conference Hall	A	0.5	22,400	
Food Court	A, B	1.5	67,200	
Sub total			**224,000**	
Others				10%
Admin. Offices	A, B	1	44,800	
Meeting Rooms	A	0.5	22,400	
Research (R& D) Area	A, B	1	44,800	
Storage Room	B	0.25	11,200	
Mosque	B	0.25	11,200	
		Sub total	**134,400**	
Total floor Area (A+B)		30	**1,344,000**	100%
Common space /Utility	Block C	30	156,000	
(Foyer, Lobby, Fresh rooms, etc.)				
Total building area per floor (A+B+C)			**150,000**	

7.14 Leasable Areas

The lease-able area in **the Multi-Tenant Building (**MTB) in 3 Blocks, A, B & Cis provided below.

Table 7.4: Lease-able area of MTB Floors

Block	Area (sft.)	
Block A (Leasable area)	280 ft. x 80 ft.	22,400
Block B (Leasable area)	280 ft. x 80 ft	22,400
Block C (Common utility area)		5,200
Total area per floor		**50,000**
Net leasable area per floor		44,800
No of Floors	30	
Lease able Area per floor	44,800	sft
Total Lease able Area/ MTB	1,344,000	sft
Total Lease able Area in 2 MTB	**2,688,000**	**sft**

7.15 Project Designs and Brief Specifications

Building Design

The design of the ICT village is expressed in a building design philosophy. In building design, the main facilities ,i.e., the Multi Tenant Building (MTB) and the Facilities Building (Conferences, Seminars, Food facilities) etc. is proposed to be designed as a Smart Building with RCC frame structures for quick implementation as well with e-glass (solar radiation limited glass for energy conservation).

The design philosophy of the project and the site involved creating an atmosphere of tranquility, good environment, and use of less area on site as possible and for future expansion.

The soil conditions on the site is to be tested before construction work starts and the recommendations of the soil test results are to be used for foundation design. Some Design salient features are mentioned below.

Structural Steel Building

The MTB and other building of Mohakhali ICT village have been designed as standard RCC frame structural building. This means that the whole building is built with RCC column and beam frame structure. The floors and roofs are also made of conventional RCC structure.

Energy Efficiency with E-Glass cladding

The main STP buildings will be clad mostly with thermal E-Glass, which cuts down heat gains by 50% as against normal curtain wall glass. Further, to minimize the heat gain and to reduce the cooling load and thus energy requirements further, double sunscreens at 9' and 12' levels will be will be incorporated. It is estimated that multiple design elements will reduce the

heat gain load thus energy requirements by 40% to 50% of normal glass clad office buildings.

RCC Service Core

To give structural stability and particularly against earth quakes, the MTB building is designed with a RCC core. Secondly, it has been provided with provided fire escape provision to its users by providing two fire rated RCC stairs as insulators against for the users of the building. Service Core provides two sets of washrooms (male and female) for its users. The service core will provide vertical shafts (Risers) for fire water lines, electrical risers and bus ways, and for Fibre Optics cables.

Ceilings and Floors

The ceilings and floors will have provisions for cooling ducts and electrical and power services. The ceilings should be equipped with sprinkler systems for localized fire suppression, before it will have opportunity for spreading. The Floors will have an elevated system, capable of carrying all the cables and fibre optics and future requirement of any part of the floors.

Mechanical and Service space

Behind the Service Core, across a corridor, there will be a designated space for mechanical equipments, including compressors for cooling of each floor.

Air Conditioning

For economy and easy maintenance, instead of a centralized cooling system with cooling towers and chilling system, the system proposed is one with a localized A/C.

8

Cost Estimates

8 COST ESTIMATES

8.1 Approach

The Approach to cost estimate at this stage, without a detailed design is to use unit cost per item. This means that a unit cost of items of works such as buildings, foundations, architectural elements and finishes, roads, bridges, etc. are assumed on the basis of existing market rates and official schedule of rates of public institutions. Then that assumed figure is multiplied with the total area or volume (as may be the case). The multiplied number is then used a cost of the element. When all items are accounted for, then on adding the sub totals the total estimated cost is determined.

Depending on final designs and programs, the final costs after detailed design and quantity based estimates may vary up to 20% from the original unit based costs. As such 20% contingent expenditure is added in these initial feasibility study level estimates.

Cost estimates for the buildings are calculated on the basis of 'Plinth Area Rates (PLAR)'. The method is used where detail Architectural and Structural design is not available. The rates are taken from PWD 'Schedule of rates 2014' and market rates of 2014.

8.2 Public and Private Sector Involvement

This project has been designed as PPP project with participation of both public and private sector. The land belongs to the government and it will allow a preferred private sector entity to construct the infrastructure and operate those under a contract.

Initial development of the site, Construction of the Administrative building will be done by the public sector, i.e. by BHTPA. The BHTPA will also be responsible for providing basic infrastructure of the ICT Park, which includes water supply, electricity, gas and internet connections.

Certain portion of the project site is earmarked for future development of the village by government agency. The public sector will involve them by constructing administrative and social buildings and facilities of the ICT village, according their future programs and design. For these buildings, estimates are not prepared.

The private sector will be involve in development of ICT business zone and other business, residential and amusement zones in the Mohakhali ICT village.

8.3 Project Cost Summary

The **cost summary** for development of different zones in the Mohakhali ICT village is given below. Tentative investment cost by the private and Public sectors have also been shown separately.

Table 8.1: Cost Summary for development of different zones in the Mohakhali ICT village

Estimated Cost in Million Taka

	Zone	Million Taka	Development by Private Sector	Development by Public Sector
1	Zone-1 (ICT Business)	12,638.08	12,638.08	-
2	Zone -2 (Hotel Business)	3,289.42	3,289.42	-
3	Zone -3 (Convention & Training Centers)	926.71	926.71	-
4	Zone -4 (Residential)	644.32	644.32	
5	Zone -5 (Recreational)	90.66	90.66	-
6	Zone -6 (Administrative)	367.16	-	367.16
	Total Cost	**17,956.36**	**17,589.19**	**367.16**
	Say	**18,000.00**		

The detail cost estimates for site development and construction of different types in structures provided the master plan have been prepared. The zone-wise project development costs are provided in next sections.

8.4 Zone 1 Development Cost

Table 8.2: Cost Estimates for Zone-1 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B/ D	Area	Quantity	Unit	Rate	Amount
			ft	ft	sft			(Tk/unit)	Mil Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	ZONE-1: ICT Business zone								
1	Multi Tenant Building (MTB) - Steel frame structure 50,000 sft x 30 floor	2			1,500,000	3,000,000	sft	3,200	9,600.00
2	Internal Utilities (electrification, sanitary, plumbing, etc. 10% of civil cost)								960.00
3	HVAC installations for the building (10% of civil cost)								960.00
4	Onsite-infrastructure (Water, electricity) 5% of civil cost								480.00
5	Internal Roads				31,150	31,150	sft	800	24.92
6	Internal Boundary Walls	1	3,450			3,450	ft	3,000	10.35
7	Landscaping	1				1	LS	1,000,000	1.00
								Sub-total	12,036.27
	Contingency 5%								601.81
	Total for Zone-1								**12,638.08**

8.5 Zone 2 Development Cost

Table 8.3 Cost Estimates for Zone-2 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B/D	Area	Quantity	Unit	Rate	Amount
			ft	ft	sft			(Tk/unit)	Mil. Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	ZONE-2: HOTEL Business zone								
1	5 star Hotel Building 2 x 25,000 sft x 20 floor	2			1,000,000	1,000,000	sft	2500	2,500.00
2	Utilities (Internal electrification, sanitary, plumbing, etc (10% of civil cost)								250.00
3	HVAC installations for the building (10% of civil cost)								250.00
4	Onsite-infrastructure (Water, electricity) 5% of civil cost								125.00
5	Internal Roads				1,600	1,600	sft	800	1.28
6	Internal Boundary Walls	1	1,500			2,000	ft	3,000	6.00
7	Landscaping	1				1	LS	500,000	0.50
								Sub-total	**3,132.78**
	Contingency 5%								156.64
	Total for Zone-2								**3,289.42**

8.6 Zone 3 Development Cost

Table 8.4: Cost Estimates for Zone-3 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B/ D	Area	Quantity	Unit	Rate	Amount
			ft	ft	sft			(Tk/unit)	Mil. Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	ZONE-3: Convention & Training Centers zone								
1	Convention Center 15,00 sft x 3 flr.	1			45,000	45,000	sft	2,200	99.00
2	Training Institute 12,000 sft x10 floors	2			120,000	240,000	sft	2,500	600.00
3	Utilities (Internal electrification, sanitary, plumbing, etc (10% of civil cost)								69.90
4	HVAC installations for the building (10% of civil cost)								69.90
5	Onsite-infrastructure (Water, electricity) 5% of civil cost								34.95
6	Internal Roads				5,800	5,800	sft	800	4.64
7	Internal Boundary Walls	1	1,230			1,230	ft	3,000	3.69
8	Landscaping	1				1	LS	500,000	0.50
								Sub-total	**882.58**
	Contingency 5%								44.13
								Total for Zone-3	**926.71**

8.7 Zone 4 Development Cost

Table 8.5: Cost Estimates for Zone-4 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B / D	Area	Quantity	Unit	Rate	Amount
			ft	f	sft			(Tk/unit)	Mil. Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	ZONE-4: Residential zone								
1	Residential Buildings 8 x 2,500 sft x 8 fl.	8			20,000	160,000	sft	2,200	352.00
2	Dormitory Buildings 6,000 sft x 6 floors	2			36,000	72,000	sft	2,200	158.40
3	Utilities (Internal electrification, sanitary, plumbing, etc (10% of civil cost)								51.04
4	Onsite-infrastructure (Water, electricity) 5% of civil cost								25.52
5	Internal Roads				19,600	19,600	sft	800	15.68
6	Internal Boundary Walls	1	3,500			3,500	ft	3,000	10.50
7	Landscaping	1				1	LS	500,000	0.50
								Sub-total	**613.64**
	Contingency 5%								30.68
	Total for Zone-4								**644.32**

8.8 Zone 5 Development Cost

Table 8.6: Cost Estimates for Zone-5 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B/ D	Area	Quantity	Unit	Rate	Amount
			ft	ft	sft			(Tk/unit)	Mil. Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	ZONE-5: Recreational zone								
1	Boat Club 10,000 sft x 2 flr.	1			20,000	20,000	sft	2,000	40.00
2	Amphitheater 10,000 sft	1			10,000	10,000	sft	2,000	20.00
3	Utilities (Internal electrification, sanitary, plumbing, etc (10% of civil cost)								6.00
4	HVAC installations for the building (10% of civil cost)								6.00
5	Onsite-infrastructure (Water, electricity) 5% of civil cost								3.00
6	Internal Roads				3,700	3,700	sft	800	2.96
7	Internal Boundary Walls	1	960			960	ft	3,000	2.88
8	Jetties, shore and other facilities					1	LS	5,000,000	5.00
9	Landscaping	1				1	LS	500,000	0.50
								Sub-total	**86.34**
	Contingency 5%								4.32
	Total for Zone-5								**90.66**

8.9 Zone 6 Development Cost

Table 8.7: Cost Estimates for Zone-6 development

Estimated Cost in Million Taka

Sl No	Item	Nos.	Length	B / D	Area	Quantity	Unit	Rate	AMOUNT
			ft	ft	sft			Tk/ Unit	Mil Taka
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
-	**Site Development**								
1	Bank protection works by timber piling		2,500	-	-	2,500	rft	2,000	5.00
2	Land filling by dredged spoil (1/2 acre)			30	21,780	653,400	cft	0.75	4.90
	Administrative Building								
4	Administrative Building 10,000 sft x 5 fl.	1			50,000	50,000	sft	2,000	100.00
5	Utilities (Internal electrification, sanitary, plumbing, etc (10% of civil cost)								10.00
6	HVAC installations for the building (10% of civil cost)								10.00
7	Internal Boundary Walls, zone-6	1	1,160			1,160	ft	3,000	3.48
8	Internal Roads and drains in zone-6				2,000	2,000	sft	800	1.60
	Common Utilities								
9	External Boundary Walls	1	6,000			6,000	ft	4,000	24.00
10	Internal main road	1			69,000	69,000	sft	800	55.20
11	Gate House & Reception					1	LS	1,000,000	1.00
12	Deep TW and Water supply system					1	LS	12,000,000	12.00

Sl No	Item	Nos.	Length	B / D	Area	Quantity	Unit	Rate	AMOUNT
13	Sewage system					1	LS	4,000,000	4.00
14	Electric Sub-station and Generators					1	LS	4,000,000	4.00
15	Gas Connections					1	LS	12,000,000	12.00
16	Landscaping					1	LS	500,000	0.50
	Off-site Infrastructure								
18	Fibre Optic Connectivity, from main backbone							10,000,000	10.00
19	Electricity Connection (external works, generators, etc.)							50,000,000	50.00
20	Electro-mechanical equipment (Generators, Lifts, CCTV, Fire and security equipt., etc.)							30,000,000	30.00
21	RCC Bridge over Gulshan Lake, from Mohakhali-Gulshan Main Road to Karail Site		800			1,000	ft.	12,000	12.00
								Sub-total	**349.68**
	Contingency 5%								17.48
								Total	**367.16**

8.10 Social Resettlement Cost

The following options may be considered for resettlement of inhabitants of the project area:

- ***Option I : Resettlement by Government with Cash Compensation***

  BHTPA with support from its Ministry and other government agencies takes responsibility to compensate the project affected persons and the responsibility of resettlement is vested on the project affected persons.

- ***Option II:* Resettlement by PPP Investor with Cash Compensation**

  BHTPA provides responsibility to the PPP Investor[1], to pay-off the project affected persons with sufficient compensation. The responsibility of resettlement will be with the PPP investor.

- ***Option III: Off-site Resettlement by PPP Investor***

  BHTPA provides responsibility of resettlement to the PPP Investor with obligation to provide a replacement site/housing outside the boundaries of the project.

- ***Option IV: Off-site Resettlement by PPP Investor with Real Estate***

  The responsibility of resettlement is also provided to the PPP Investor with obligation to provide a replacement site/housing outside the boundaries of the project. However, the PPP Investor is allowed to recover the resettlement costs from premium housing built within the project boundary. Thus in balance, capital outlay for resettlement may be returned from the income from premium housing.

- ***Option V: On-site Resettlement by PPP Investor***

  The responsibility of resettlement is also provided to the PPP Investor. However, the PPP investor will be provided land within the project boundary for building the economy housing for resettlement. Investor will build premium housing and economy housing (for resettlement) facility. Revenue generated from premium housing will cover the cost of economy housing and resettlement.

- ***Option VI: Resettlement of Entire Karail Area[2]***

  GoB will take the responsibility of resettlement of the entire Karail slum. This will require inter-ministerial decision with the involvement of three executing agencies – BHTPA, BTCL and PWD.

[1] This responsibility is executed through the resettlement partner, UPPR. The PPP Investor provides the cash or a combination of cash and kind, depending upon the resettlement option chosen.

[2]This option is outside the present scope of work in the assignment. However, in discussions with stakeholders, it was pointed out that if inhabitants from certain parts of the Karail were compensated and rehabilitated to an equal or better condition, then the people adjacent to them may become unhappy and resist the rehabilitation process in the BHTPA area. Thus it was decided to have another option that covered the entire Karail area, recognizing that it needed an inter-ministerial decision of three agencies – BHTPA, BTCL and PWD.

Table 8.2: Summary of Cost Estimates under Different Resettlement Options

	Options	Total Resettlement Cost (Tk million)	Remarks
Option I :	*Resettlement by Cash from GoB*	496	BHTPA will need to arrange this fund for the resettlement
Option II:	*Resettlement by Cash from PPP Investor*	496	ICT village project needs to cover this fund and hence core ICT village project becomes less attractive to investor
Option III :	*Off-site resettlement by PPP Investor*	1,304	As above but with a higher price to the investor
Option IV :	*Off-site resettlement by PPP Investor with real estate*	1,304	PPP investor is neutral to resettlement as resettlement costs covered by premium housing
Option V :	*On-site Resettlement by PPP Investor*	3,037	a. PPP investor is neutral to resettlement costs b. BHTPA becomes owner of 5,223 appartments and 263,952 sft commercial space worth Tk 10,500 million c. BHTPA yearly income will be Tk 280 million per year
Option VI:	*Resettlement of Entire Karail Area by PPP Investor*	*5742*	a. PPP investor is neutral to resettlement costs b. Other land owners may have less urgency than BHTPA c. Land requirement for resettlement may be reduced on part of BHTPA

9

Implementation Option for The ICT Village

9 IMPLEMENTATION OPTIONS FOR THE ICT VILLAGE

The Mohakhali ICT Village is part of the Government of Bangladesh's "Digital Bangladesh" initiative. It is one of seven such sites being planned across the country. The government wants to develop and strengthen the country's ICT sector, and establish Bangladesh as a top destination for international firms in the field. ICT villages like the one in Mohakhali, are an integral part of this development plan. ICT Villages are areas dedicated to the development of a country's software and ICT industry. They provide a variety of services including High Speed Data Communication, Incubation facilities, Consultancy, Network Monitoring, Data Centers and Data Hosting to name a few.

The project site in Mohakhali will be home to various IT related businesses, such as software developers and BPOs from both home and abroad. The core business of the site will be Multi-Tenant Buildings (MTBs) that will house various firms from the ICT industry. Additionally, there will be non-core business buildings, including dormitory and residential facilities, hotels, training and convention centers, recreational zone etc.

The ICT Village will be composed of 6 zones:

- Zone 1: ICT Business Zone
- Zone 2: Hotel Business Zone
- Zone 3: Convention and Training Centers
- Zone 4: Residential Zone
- Zone 5: Recreational Zone
- Zone 6: Administrative Zone

Zone 1 – Zone 5 may be implemented through PPP while Zone 6 will be developed and operated by BHTPA. Due to the diverse nature of businesses in the different zones it is recommended that development of different zones through PPP is conducted through separate PPP Agreements. One or more PPP Investors may be awarded PPP Contracts to develop and operate the zones separately.

This project requires heavy investment, and its long term success and sustainability depends on efficient operations and maintenance (O&M). In this regard, a Public-Private Participation approach would be feasible. Public-Private participation refers to the deals where a Government Executing Agency provides a right to a PPP Investor to provide services to multiple entities or common users with an infrastructure or asset. Such services are usually monopolistic in nature, or are close to being a monopoly. Under PPP arrangement, the Executing Agencies have to undertake a monitoring role over the service delivery, for ensuring quality and availability of service or in some cases, for regulating the tariffs for the services.

The critical factor in choosing an institutional option lies with the mode and financing of acquisition or purchase of land for developing the village. The

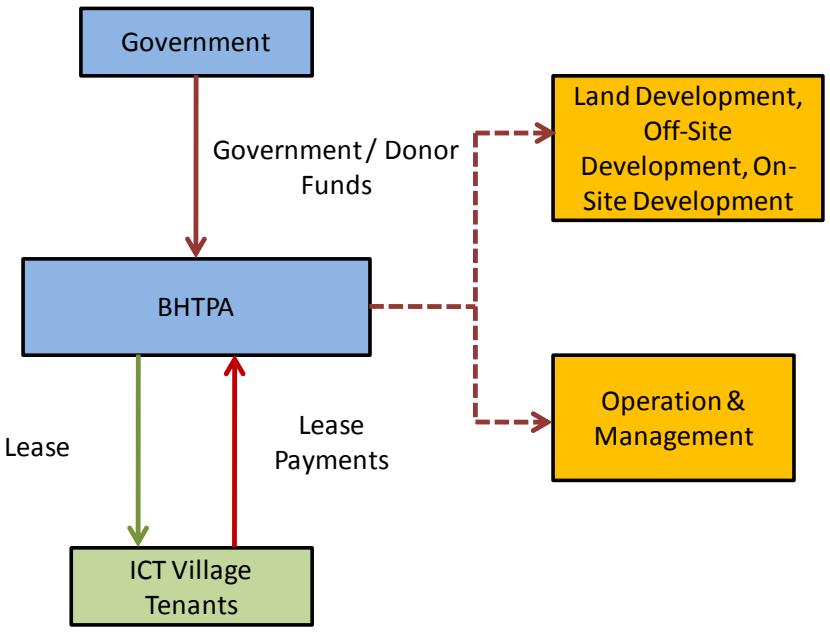
institutional option varies with different levels of participation from government and private sector. Investment options for development of Zone 1: ICT Business Zone of the ICT village is discussed in the following sections.

9.1 Option A: Government Led Model

In this model, BHTPA will be responsible for land development, off-site development, on-site development, financing, and O&M of Zone 1. Land development as well as social rehabilitation of inhabitants at project site will be undertaken by BHTPA. BHTPA will also develop on-site infrastructure such as roads, electricity connections, sewerage etc. They will also be responsible for the construction of both core business building – the Multi Tenant Buildings, as well as non-core facilities.

After completion of construction of MTBs, BHTPA will lease out office spaces to tenants and receive lease payments in return. BHTPA will also be responsible for O&M of the zone. The overall structure is presented in Figure 9.1.

Figure 9.1: Option A: Government Led Model



This option needs BHTPA to have mandate (in its Memorandum and Articles of Association), as well as capacity, to spend funds to carry out such business of an ICT village owner, developer and operator.

The advantages of this model are as follows:

- Lease rate of space is likely to be low compared to other models.
- IDA funding can be made available.

The disadvantages of this model are as follows:

- Private sector efficiency in operating and maintaining the village is not achieved.
- Government will need to make substantial investment to make the village operational.
- No executing agency capable of operating and maintaining the village has been identified.
- No clear source of government funding for making such a substantial investment has been identified.

9.2 Option B: O&M Outsourcing Model

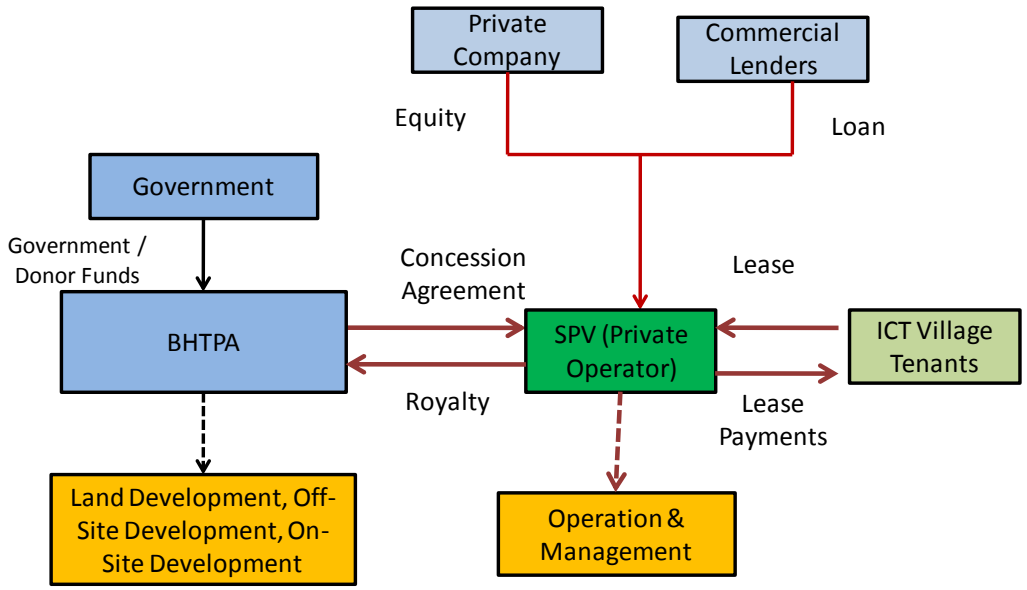
In this model, land development, off-site development, on-site development, financing and construction of the village will be carried out by BHTPA. BHTPA will also be responsible for social rehabilitation of inhabitants on the project site. A private operator will be responsible for O&M of the zone. This model is a PPP for O&M of Zone 1.

BHTPA will also develop on-site infrastructure such as roads, electricity connections, sewerage etc. They will also construct core business buildings (Multi Tenant Buildings), as well as non-core facilities. In parallel, BHTPA will invite tender from potential private developers to operate and maintain the zone.

The private operator, after being selected and awarded the project, obtains a lease over the land for the concession period, through a PPP Agreement and a lease agreement is signed by BHTPA and the private operator SPV. The private operator SPV will be financed by the private operator's own equity and loans from commercial lenders.

The private operator will pay royalty to government over the concession period and sub-lease out space to tenants based on certain criteria set by the government. The tenants will pay lease rentals to the operator. The overall structure is presented in Figure 9.2.

Figure 9.2: Option B: O&M Outsourcing Model



The advantages of this model are as follows:

- Private sector efficiency is achieved but only for the operation and management
- Shorter Concession period
- Low lease rate of space is likely
- Government will receive higher royalty

The disadvantages of this model are as follows:

- Government is responsible for all capital investment of Zone 1.
- No clear source of government funding for making such a substantial investment has been identified yet.

9.3 Option C: Concession PPP Model (BOT)

PPP is the partnership where the public sector agency, after upfront development of Zone 1, provides the responsibility of downstream development and operation to the private sector. The scope of upfront development and downstream development and operation is discussed below.

Upfront Development

Upfront development may be defined as preparatory activities like project identification and preparation, preparation and development of preliminary interior master plan etc.

Downstream Development and Operation

After the upfront development, PPP Investors will be invited to conduct downstream development and operation of the zone. Downstream development and operation includes internal infrastructure development, as well as delineating and standardizing space for the tenants. The private developer is not only responsible for the operation and maintenance of the site, but also for attracting tenants to set up their business within the ICT Business Zone.

Delineation of Responsibilities

The share of responsibilities between the public and private sector are usually delineated along the lines provided in the following table:

Table 9.1: Delineation of Responsibilities

Public Sector	Private Sector
a) Social Rehabilitation b) Developing the preliminary Master Plan of the zone c) Guideline for developing the zone d) Defining terms and conditions defining the interrelationship between private and the public sector e) Preparation of information memorandum f) Development of off-site infrastructure g) Environmental clearance of the zone from DOE and from donors (if required) h) Regulation of the zone activities a) Land development	b) Developing space as per the Master Plan and the guidelines provided by Government Authority c) Internal development of roads, drainage and standardized floor spaces. d) Marketing to the potential entrepreneurs for setting units in the ICT Business Zone e) Environmental impact mitigation f) Reporting to appropriate authority g) Payment of royalties and license fees to the government, if any

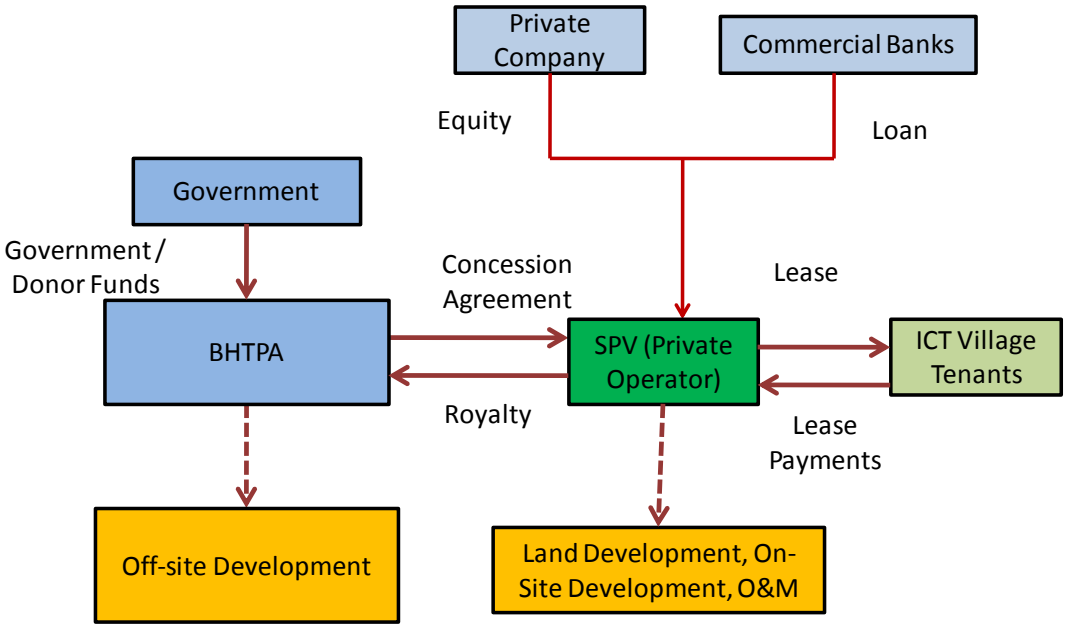
In this model, the PPP Investor will be responsible for on-site development and O&M of the village in Zone 1. Financing for on-site development will be handled by the PPP Investor. On-site development in this case refers to the construction and development of core business facilities, the Multi-Tenant Buildings.

Under this approach, the PPP Investor obtains a lease over the land for the concession period, through a Concession Agreement and a lease agreement signed by BHTPA and the PPP Investor SPV. The PPP Investor SPV will be financed by the PPP Investor's own equity and loans from commercial lenders. The PPP Investor will pay royalty to government over the concession

period and sub-lease out space to tenants after development of on-site infrastructure such as roads, electricity connections, sewerage etc.

The tenants will pay lease rentals to the investor. After completion of the Concession period, the PPP Investor will hand over O&M of the village to BHTPA. The overall structure is presented in Figure 9.3.

Figure 9.3: Option C: Concession PPP Model



The advantages of this model are as follows:

- Private sector efficiency in operating and maintaining the zone is achieved.
- Government needs substantially less investment in the zone compared to Options A and B as the major investment is undertaken by the PPP Investor.
- Government has strong control through Concession Agreement on regulation of the zone.

The disadvantages of this model are as follows:

- Private operator interest in operating and managing the zone is uncertain at this point of time and has to be tested in the market following the completion of the feasibility study.

9.4 Option D: PPP Concession Model with VGF

This option is a variation on the PPP Concession Model (Option C) discussed in Section 9.3. The features of both options are essentially similar, with the key differences being the addition of Viability Gap Financing (VGF), and the

extension of the concession period. As under the regular PPP Concession Model, the BHTPA will handle land development and off-site infrastructure development. On the other hand, the PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. It will be responsible for implementing the project, which includes the development, financing, and construction of Zone 1, as well as operation and maintenance of Zone 1 during the concession period. The concession period for this option is about 50-60 years.

Government of Bangladesh has published the Guideline for Viability Gap Funding for Public-Private Partnership (PPP) projects, 2012, for subsidizing economically viable projects that are not financially viable. The government may offer VGF, in the form of a capital grant or annuity payments, or in both forms. The VGF will cover up to 30% of the estimated project costs (excluding land), as per PPP guidelines. VGF in the form of capital grant will be disbursed during the construction phase, while the annuity payment will be disbursed on a periodic basis after the commencement of operation. The functional structure of this option is presented in Figure 9.4.

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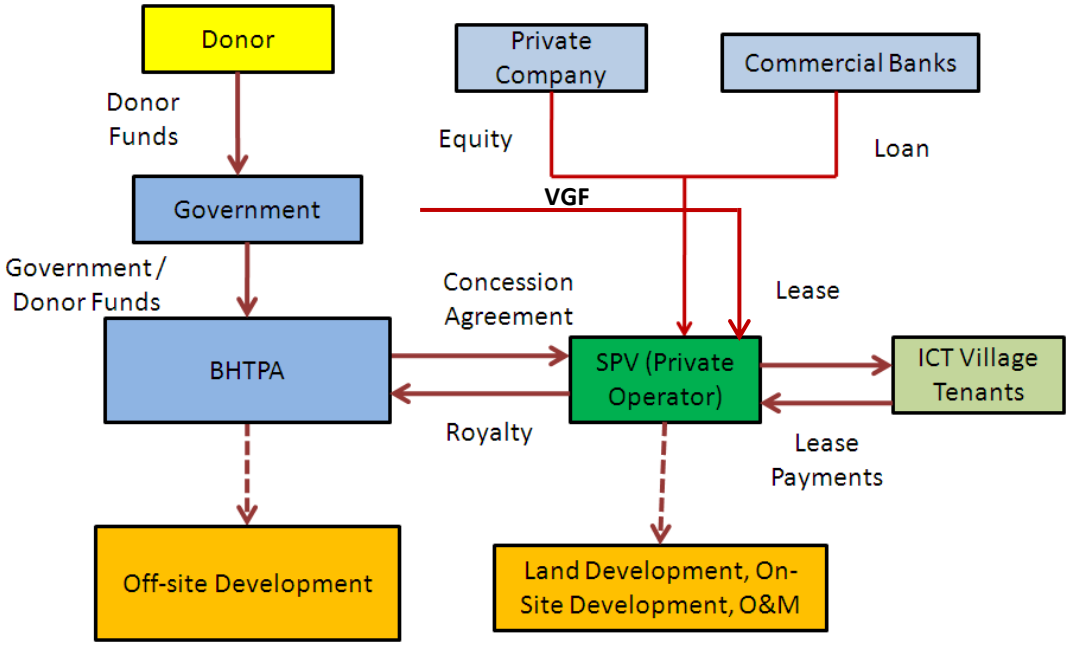
Figure 9.4: Option D: PPP Concession Model with VGF



The PPP Investor will generate revenue by leasing out space to tenants. They will also make royalty payments to BHTPA for the right to use the land. At end of the concession period, the investor will return the land and facilities to the BHTPA at a depreciated value.

The advantages of this model are as follows:

- Private sector efficiency in operating and maintaining the zone is achieved.

- Government needs substantially less investment in the zone compared to Options A and B as the major investment is undertaken by the PPP Investor.
- Government has strong control through Concession Agreement on regulation of the zone.
- Viability Gap Funding (VGF) may be provided to the SPV to increase viability of the project and attract investors.

The disadvantages of this model are as follows:

- No clear source of government funding for making investment in the village has been identified yet.
- PPP Investor interest in operating and managing the village is uncertain at this point of time and has to be tested in the market following the completion of the feasibility study.

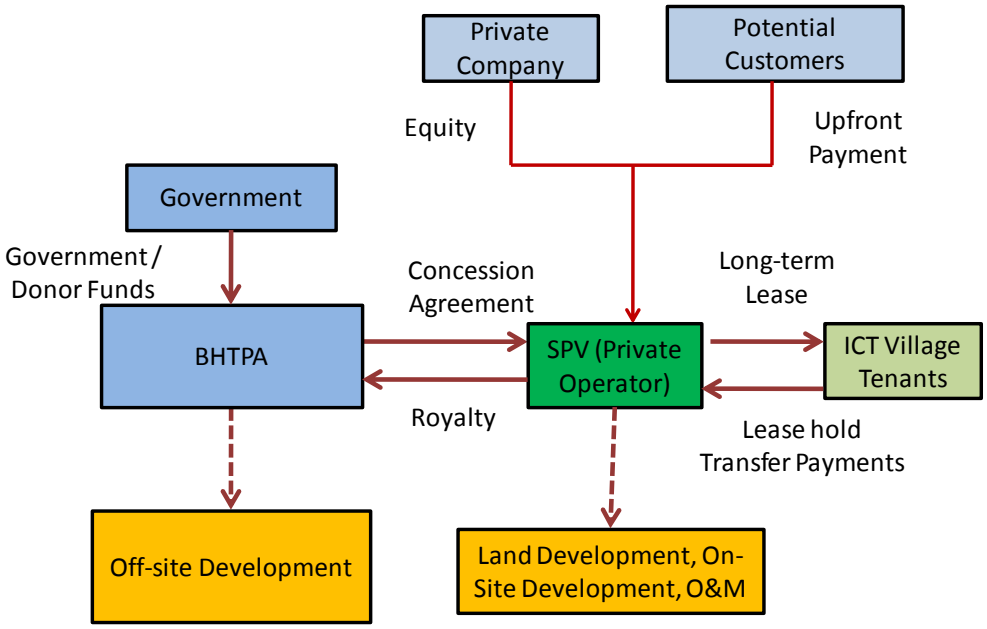
9.5 Option E: Leasehold Transfer Model

In this model, PPP Investor will be responsible for financing, construction and O&M of Zone 1 of the ICT Village. This includes the construction of the Multi Tenant Buildings and other commercial facilities in Zone 1.

Financing for on-site development will be handled by the PPP Investor. After land is handed over to the PPP Investor, the investor will be responsible for on-site development and O&M of the zone.

The PPP Investor SPV will be financed by PPP Investor's own equity and from future customers of the MTBs. The PPP Investor will transfer the lease holdings of the built-up commercial space to Zone 1 tenants for long-term leases. The tenants will pay a one-time leasehold transfer amount to PPP Investor in addition to monthly service charges. PPP Investor will be given a short term contract (8-10 years) during which it will have to construct Zone 1 of the ICT Village and transfer the lease holdings. The overall structure is presented in Figure 9.5.

Figure 9.5: Option E: Leasehold Transfer Model



During its Contract Term, PPP Investor will also be responsible for operation and maintenance of the zone. At the end of the Term, operations and maintenance will be handed back to BHTPA which may decide to form a committee for operations, with the leaseholders of the MTBs.

The advantages of this model are as follows:

- Private sector efficiency in operating and maintaining parks is achieved.
- All capital cost investment in the park is borne by the private operator.
- Implementation is likely to be faster compared to other models.

The disadvantages of this model are as follows:

- Private operator interest in making such a substantial investment for a ICT Business Zone in the country is unproven.
- Lease rates for office spaces will be very high compared to other models.

9.6 Comparison of Options

The options involve varying levels of public private participation and varying roles of each. The following table provides a comparison of options in terms of land development, financing, on-site development and O&M of Zone 1:

Table 9.2: Comparison of Options

Criteria for Comparison	Option A: Government Led Model	Option B: O&M Outsourcing Model	Option C: Concession PPP Model (BOT)	Option D: Concession PPP Model with VGF	Option E: Leasehold Transfer Model
Land Acquisition	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Off-site Development	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Land Development	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Overall Layout (Preliminary)	BHTPA	BHTPA	BHTPA	BHTPA	BHTPA
Overall Layout (Final)	BHTPA	BHTPA	PPP Investor	PPP Investor	PPP Investor
Financing and Construction	BHTPA	BHTPA	PPP Investor	PPP Investor	PPP Investor
O&M	BHTPA	PPP Investor	PPP Investor	PPP Investor	PPP Investor

9.7 Contracting Strategy for Zones

Mohakhali ICT Village is proposed to be divided into six different zones based on functions and businesses such as (1) ICT Busineess Zone, (2) Hotel Business Zone, (3) Convention and Training Centers, (4) Residential Zone, (5) Recreational Zone, and (6) Administrative Zone. All the buildings and installations in all the zones except administrative zone are to be developed by the PPP Investors, through PPP contract agreement.

Five different categories of businesses are identified for the ICT Village. BHTPA has the flexibility to bid out either seperately for each of the zones or combindely for all the zones. Since the nature of business is different from each other, it would be difficult for an investor to execute the development ICT

Village under a single contract. Therefore, it is preferred that BHTPA should invite bid for each of the zones seperately.

BHTPA has already issued a Request for Qualification (RFQ) notice on 7 November 2013 for the engagement of a single developer for the development the project. However, the idea of engaging a single developer for Mohakhali ICT Village is not worthwhile from the management and monitoring point of view.

10

Major Terms and Conditions

10 MAJOR TERMS AND CONDITIONS

10.1 Contract with the Investor

The contractual relationship between the PPP Investor and BHTPA shall be established through the PPP Agreement. The PPP Agreement shall specify the provision of granting the project to the PPP Investor, construction, operation and maintenance of the facilities, collection of charges by the PPP Investor, rights and responsibilities of PPP Investor and BHTPA, events of default for PPP Investor and BHTPA and remedies and penalties, dispute resolution mechanism, force majeure event and its consequence and liabilities, communication, other miscellaneous matters and schedules.

PPP law and regulations in the country state that PPP projects should be financed managed and implemented under an enforceable project agreement between the contracting authority and a Special Purpose Vehicle established by the successful private party with a sole purpose of executing the project. The following table describes the guidelines for the contractual agreement:

Agreement will set forth clear guidance on the following key issues where applicable:

- The term of the project agreement, timing of implementation and the process by which the project will be deemed to meet contractual specifications during its commissioning tests;
- A management plan that sets forth how the project will be operated and managed during the project agreement term;
- Penalties for failure to meet schedule and/or specifications at commissioning or failure to adhere to best practice standards during operations;
- Stepping in rights of lenders;
- Responsibilities related to environment mitigation;
- A clear mechanism as to how tariffs, or user charges, will be set;
- A clear payment mechanism;
- Allocation of risks to the party best able to manage them;
- Process by which the project will be monitored by Government for adherence to the project agreement;
- Events of default, remedies, timing;
- Provisions related to the transfer of the asset at the conclusion of the project agreement;
- Dispute resolution process;
- Governing law and jurisdiction of the contract; and
- Any other provisions

10.2 Term of Contract

The term of the contract may be set at **30 -50 years for Concession PPP Model** or **10 years for Leasehold Transfer Model** for construction and lease of built up space from the Contract Effective Date. The Contract Effective Date will occur subject to fulfilment of Conditions Precedent.

One of the major Conditions Precedent will be handover of clear land to PPP Investor by BHTPA, after rehabiliation of project area inhabitants.

The Term of the PPP Contract will include financing, construction and O&M period.

10.3 Financing and Construction Period

The financing would be in the range of 6 months and construction period would be in the range of **3 years** which will start after the Contract Effective Date.

10.4 Tariff Structure

The tariff structure shall be as discussed in Chapter 12.

10.5 Rights of BHTPA

BHTPA shall have the following rights: (i) right to introduce competition, (ii) right to monitor site.

10.6 Major Obligations of BHTPA

The major obligations of BHTPA are:

(i) Rehabilitate inhabitants of the project site and hand over clear land to PPP Investor

(ii) enable access to the site

(iii) carry out all associated/linked projects on a timely basis

(iv) assist the PPP Investor in obtaining the required permits and approvals

(v) assist the PPP Investor in importing equipment and materials.

10.7 Rights of PPP Investor

The PPP Investor shall have exclusive control over the design, financing, construction and operation of ICT Village, including the collection of lease payments from the tenants.

10.8 Major Obligations of the PPP Investor

The major obligations of the PPP Investor are:

(i) To provide BHTPA with resettlement amount, If resettlement option II is chosen

(ii) to construct economy housing for resettlement of inhabitants if Resettlement Option III, IV or V is chosen

(iii) to complete the construction of the Multi Tenant Building and other facilities in Zone 1, and bring it into operation by the Commercial Operations Date,

(iv) Rollout obligations – the PPP Investor will make further investment in facilities, subject to future demand,

(v) to place a construction Performance Guarantee within due time,

(vi) to comply with reporting requirements,

(vii) to maintain appropriate books of accounts according to the Generally Accepted Accounting Principles (GAAP) and records of costs and revenues,

(viii) to ensure proper safety and security, and fire protection,

(ix) to abide by all applicable laws,

(x) to abide by all relevant civil construction codes during construction.

10.9 Penalty Provisions for the PPP Investors

Non achievement of social resettlement

Penalty may be applicable to the PPP Investor for not constructing economy housing for social resettlement as per requirements of BHTPA, if resettlement option III, IV or V is chosen.

Lack of Demand due to Lack of Marketing or other reasons

The PPP Investor will absorb the demand risk and will automatically incur a loss due to inadequate demand. Therefore, it is not prudent to impose penalties for lack of demand.

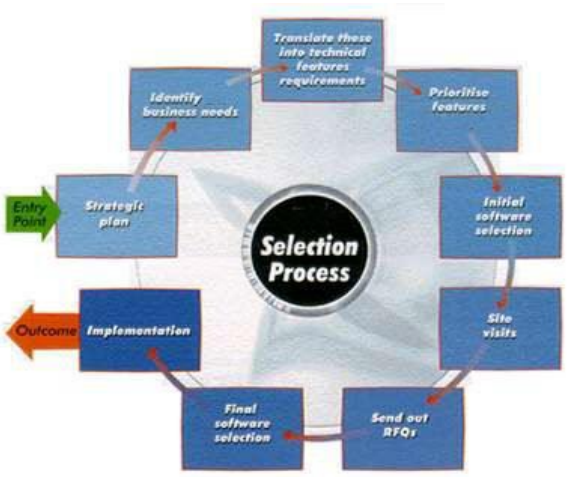
10.10 Bid Security

A Bid Security will be applicable for the project, at a certain percentage of the estimated project cost.

10.11 COD Performance Guarantees

The project company shall submit a construction performance guarantee as security at the time of signing the PPP contract to ensure that the obligations for constructing the core business facilities are carried out. The guarantee will be released once the construction is completed.

11



Investor Selection Process and Criteria

11 INVESTOR SELECTION PROCESS AND CRITERIA

Engaging a private operator is typically a step-by-step process. The steps involved are described in the following paragraphs:

11.1 Planning for Engaging Private operator

The plan should cover the optimum strategies and options for private sector participation. It discusses the design of interrelationship between BHTPA and the private operator, the strategy for good publicity and advertisement of the deal (*i.e.* communication plan), the method of sale, the steps required to reach sale and a timeline.

A well-thought communication plan is required, so that sufficient transparency exists in the process and information is disseminated to all relevant stakeholders and the decision makers. It will prevent the risk of the program being stuck in the middle due to difficulty in making decisions.

The plan should also include the tendering method. This should contain the steps and timeline of tendering, responsibilities of government officials and advisers, production of sale documents (for example, information memorandums prospectuses), legal tasks and timeline.

11.2 Obtaining Approvals

The plan needs to be approved by the authority appropriate for BHTPA and PPP policy guideline of the country, so that later the progress is not restricted due to lack of decisions. Such approval is needed before notice of invitation for tender is advertised.

11.3 Qualification

The Private Operator selection process will start with Request for Qualification (RFQ) by BHTPA. After feasibility study is finalized, BHTPA will issue a public notice for inviting qualification statements for participating in the investment. A short list of the qualified Private Operators will be made, based on evaluation of the statements.

The offer for participating in the project will be open to all eligible private operators from all countries which Bangladesh has diplomatic relationship with. The successful Private Operator will be decided based on evaluation of the proposals and subsequent approval of the relevant authorities. The Private Operators may be prequalified based on the following criteria:

a) Legal Status

b) Technical and Managerial Capability

c) Financial Capability

d) Project Operating Experience

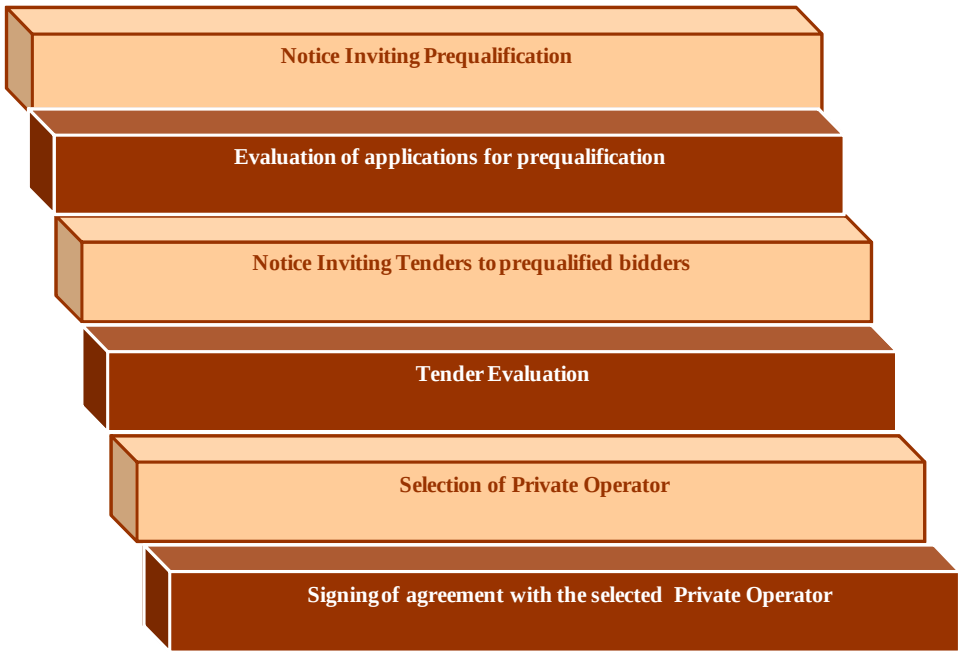
e) Current Ownership in Similar faculties

11.4 Tendering or RFP

After the approval of the short list of Private Operators is obtained, the tendering process will start with issuance for Request for Proposal (RFP). The process of engaging private operator is illustrated below:

RFP will be issued to the pre-qualified Private Operators for selecting the suitable private operator and rank them. The selected private operator will enter into an agreement with BHTPA. BHTPA will provide layout, conceptual design of the facilities and land designation to the private operator

Figure 11.1: Private Operator Selection Process



11.5 Communication Plan

IIFC will assist BHTPA in publishing the notice in national and international publication media inviting interested and potential Private Operators to participate in the tender process. In national publication media, the notice shall be published over a period of three weeks in at least four newspapers (English and Bengali). The notice may also be published in the BHTPA's and IIFC's website.

11.6 O&M Contractor Selection Criteria

The offer for participating in the project will be open to all eligible private operators[3] from all countries which Bangladesh has diplomatic relationship

[3] An eligible participant:

(a) should be a physical or juridical individual, company, association or any combination of them under agreement in the form of an intended or existing joint venture, consortium or association;

with. The successful investor will be decided based on evaluation of the proposals and subsequent approval of the relevant authorities. The following sections describe the general qualifications desired from the potential private operator. The evaluation process with steps and evaluation criteria are also presented in detail:

11.7 General Qualifications

The potential Private operator is expected to have the following competences and abilities:

f. Good knowledge of operation and maintenance of hotel or tourism facilities.

g. Ownership and operation experience of companies operating facilities of similar size

h. Knowledge of laws, rules, and regulations governing O&M of such facilities.

i. Working knowledge of the operation and maintenance of commercial complexes.

j. Ability to prepare forms and narrative inspection reports.

11.8 Evaluation Process

The potential private operators will be evaluated based on the following minimum qualification test criteria. The tests will be performed in two parts:

a) Part I Evaluation – Qualification Test
b) Part II Evaluation – Financial Ranking

(b) should have legal capacity to enter into contract with BHTPA and other persons;

(c) should not engage any consultant or person who were involved in the construction, design, procurement and supply of equipment of BHTPA and in the preparation of tender documents and other activities for engaging PPP Investor for BHTPA facilities;

(d) should not be under a declaration of ineligibility for corrupt, fraudulent, collusive or coercive practices in Bangladesh or any other countries.

(e) should not be declared as insolvent or bankrupt or being wound up, its business activities shall not be suspended and it shall not be the subject of legal proceeding for any of the foregoing.

11.9 Part I Evaluation: Technical Responsiveness Test

11.9.1 Legal Status

The participant must be a legal entity with all documentary evidence[4] in support of its legal status in the country of its incorporation and business. A separate form will be designed to receive information on legal status.

11.9.2 Relevant Experience

The potential private operator's relevant experience will need to be tested in Ownership and Operation experience of similar facility. The specific requirements with respect to relevant experience will be designed at the time of preparing bidding document in consultation with BHTPA.

11.9.3 Financial Capability

The private operator should demonstrate that it is in a sound financial position to provide sufficient working capital for carrying out the obligations of the Private operator. The participant will be asked to provide audited balance sheet to understand the net-worth of the enterprise. The prescribed net-worth will be mentioned in the tender document.

11.9.4 Operation and Maintenance Plan

The potential private operator will have to submit an operation and maintenance plan. The plan should mention the organization plan for running and selling the built up spaces, number of employees needed along with a broad hierarchy, hazard management techniques (fire-fighting, safety measures etc) during operation, procedure of future refurbishment/replacement of existing facilities.

Separate forms will be developed for assessing the investors against all the above criteria. A participant shall have to pass in Part I evaluation.

11.10 Part II Evaluation: Financial Score

Tenders who pass Part I evaluation, will be evaluated for financial score, based on financial figures quoted. The financial figure or the parameter that may be required to be quoted depends upon the model of engaging the

[4] The documentary evidence shall include but not limited to:

(a) certificate of incorporation (if applicable);

(b) company legal documents such as registration under local authority, partnership deed, memorandum and articles of association, joint venture agreement etc.;

(c) tax certificate from the relevant governmental authority;

(d) notary certificate that there is no bar on the participant to execute the contract; and

(e) a declaration that the participant is capable of and legal capacity to enter into this contract.

private operator and discussed in the relevant section. The following are the financial parameters; any one or combination of them may be used.

a) Minimum fee to be charged to BHTPA
b) Maximum royalty to be provided to BHTPA
c) Any other parameter that may be decided by BHTPA

11.11 Ranking

The bids will be ranked based on the financial score or a combination of the technical score and financial score, which will be designed in the RFP stage.

12

Financial Analysis

12 FINANCIAL ANALYSIS

This section presents the assumptions and results of the financial analysis of the Development of an ICT Village at Mohakhali conducted by the Consultant as part of the Feasibility Study. The financial analysis is conducted from the perspective of the PPP Investor, modeling his business during the PPP Agreement Term.

Following a brief introduction, the methodology, business model and assumptions of the financial analysis are discussed in detail and the findings and results of the analysis are presented.

12.1 Introduction

The objective of the Mohakhali ICT Village is to establish knowledge based industries in Mohakhali, particularly related to Software and IT Enabled Services, and thus contribute to the national economy and achieve the goals of Vision 2021: Digital Bangladesh. Government has allocated 47 acres of land in Dhaka city situated in Karail village within the city. The ICT Village is proposed to consist of two Multi Tenant Buildings (MTB) which will accommodate ICT industry offices and also include key ancillary facilities and support services.

The principal goals of the ICT Village are broadly be as follows:

- Technology development and diffusion
- Employment generation
- Stimulate the formation of new technology-based firms and the growth of existing technology-based firms
- Facilitating the growth of ICT SMEs
- Competence development – enhancing the competitiveness of existing as well as new units in the region
- Regional development and regeneration
- Attracting large national and international companies, thereby attracting inward investment by creating world-class, world-scale physical facilities and proactive support services
- Fostering spin-off firms started by academics thereby helping commercialise academic researches and strengthen local university association with the ICT Village

The ICT village will also accommodate a range of ancillary facilities such as cafeteria, data center, banks, gymnasiums, conference hall, dormitory, residential buildings, hotels, training and convention centers, recreational facilities etc.

The financial analysis is based on information gathered from BHTPA, market and industry survey, consultation with relevant stakeholders and free lancer survey.

The Financial Model prepared for financial analysis uses information and analysis presented in the previous chapters. The following information has been used in preparing the financial model:

- Demand Forecast for the ICT Village– presented in Chapter 6
- Conceptual master plan of the site – presented in Chapter 7
- Proposed design and floor plans of the ICT Village – presented in Chapter 7
- Estimated development costs – presented in Chapter 8
- Investment models – presented in Chapter 9
- Social Resettlement models – presented in Volume II

Estimations of operational costs, cost escalations and financing structure have been made for the financial analysis.

12.2 Objectives and Methodology of Financial Analysis and Financial Model

The key objectives of preparing a financial model for financial analysis are as follows:

a. to demonstrate the financial viability of development of the ICT Village based upon demand forecast, expected lease rates, cost estimates, planning parameters and other information.

b. to illustrate the sensitivity of the financial and commercial viability to key parameters and to identify the areas which could be adjusted (lease rates and other issues) to influence the profitability of the project.

c. to determine the requirement of initial support and later on to implement project on a commercial footing.

The main approach was to determine the financial viability of the project on the basis of an assessment of demand forecast for office space for ICT firms, revenue collection from commercial areas, capital cost estimate for the project, revenue projection and financing structure (**Error! Reference source not found.**).

Figure 12.1: Determining the Financial Viability

Financial analysis of the project took into consideration, such factors as:

- ✓ Short and long-term financial obligations; projected revenue stream, projected costs (fixed and variable), depreciation schedule and asset construction schedule;
- ✓ Demand forecast for leasable area of the ICT Village;
- ✓ Lease rate structure and the impact of amendments in that structure;
- ✓ Sources and cost of capital

The financial model covered the following:

a. Determination of the revenue projection, projection income statements and cash flow statements over the life of the project.

b. Calculate various matrices such as IRR, payback periods and debt-service coverage ratio for assessment of project viability.

c. Sensitivity analysis on the major parameters including capital cost, O&M cost, lease rate etc. in order to explore its sustainability under different changing situations.

d. Financial analysis of options for cost recovery of capital investments and recurrent costs under different demand forecast scenarios.

The result of combining cost and revenue projections were presented as output indicators. The financial model, comprising projected revenue, income statement and cash flow projections, was prepared in order to assess the impact of the proposed project on financial performance and viability.

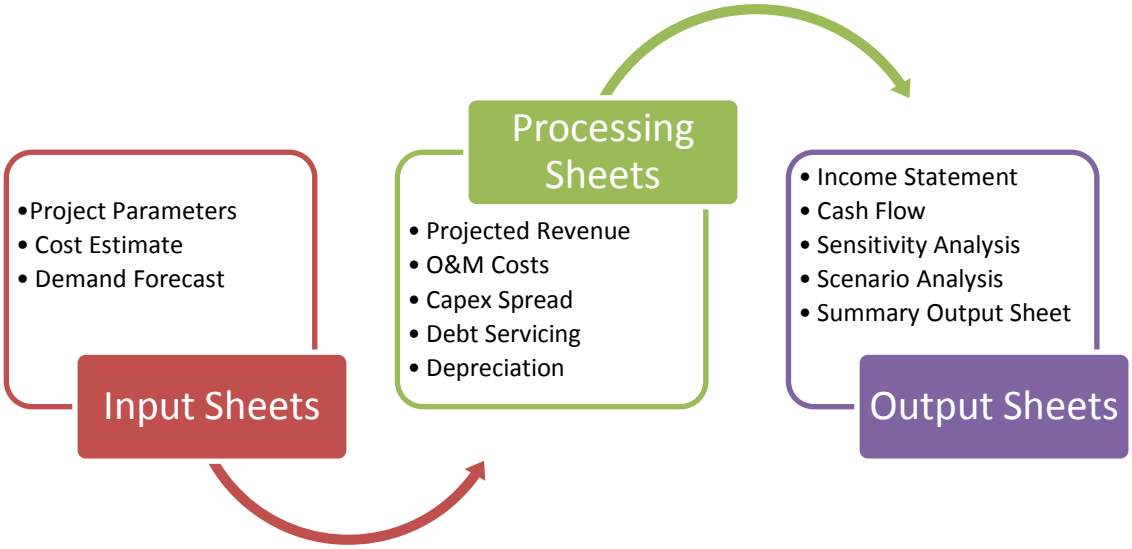
12.3 Structure of the Financial Model

The financial analysis for the project was conducted using a spread sheet based model providing:

(1) a projection of each component of cost and expenses on the basis of a consistent set of background financial/economic assumptions; and,

(2) the revenue generated by a given structure of revenue sources. The results of combining cost and revenue projection was presented as output indicators as shown in Figure 12.2.

Figure 12.2: Flow Chart of the Financial Model



The model contains interlinked sheets keeping in view of the available data and information. The sheets of the model are as follows:

Input Sheets	1) Project Parameters
	2) Cost Estimate
	3) Demand Forecast
Processing Sheets	4) Debt Servicing
	5) Projected Revenue
	6) Depreciation
	7) Projected O&M Costs
	8) Asset Schedule

Result Sheets

9) Income Statement
10) Cash Flow
11) Sensitivity Analysis
12) Scenario Analysis
13) Summary Output Sheet

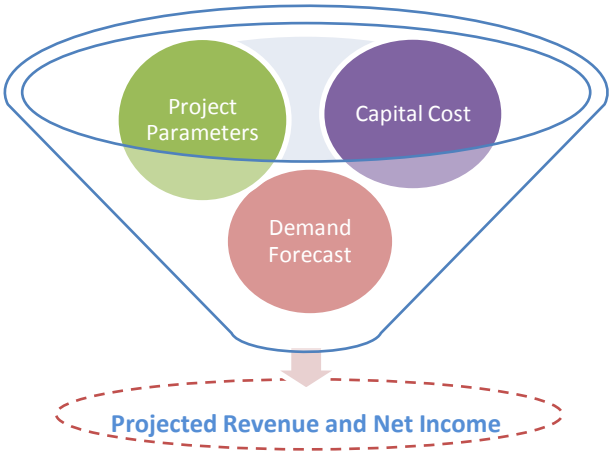
The input and input support sheets accommodate all the basic inputs of the project required for the financial model. These inputs have connection with other sheets (processing/intermediate calculation) where specific calculations are made. Then the outcomes of the individual sheets were connected to the result sheets to obtain the final results. Sensitivity analysis is also included in the model to test its sensitiveness on change of different important parameters.

The interlinked sheets as used in the financial model are briefly described below.

12.3.1 Input and Input Support Sheets

The input sheets include (1) project parameters sheet (2) project cost sheet, and (3) demand forecast sheet (Figure 12.3).

Figure 12.3: Input Sheets in the Model



Project Parameters Sheet

This sheet contains all the major parameters of the project wihich will act as inputs to the model. The parameters include: (1) construction period, (2) leasable commercial area (3) financing structure (3) cost escalation factors etc.

Capital Cost Sheet

Capital cost sheet includes hard costs and soft costs of the project. Hard costs are composed mainly of civil construction costs. Soft costs include the project management costs, working capital, interest during construction (IDC) etc.

This worksheet provides a summary of the project costs for the ICT Village develpoment business. This worksheet has an onward relationship with depreciation sheet, capex spread sheet and cash flow sheet.

Demand Forecast Sheet

Demand Forecast for leasable space is summarized in this sheet. The sheet provides different demand projections based on different space takup scenarios. The projected demand is used for determining the projected revenue and projected variable costs for the project.

This sheet has an onward relationship with the Revenue and O&M sheets.

12.3.2 Processing Sheets

The processing sheets compute and process data as provided in the project parameters and capital cost sheets. The processing sheets are follows:

(1) debt servicing (2) revenue, (3) depreciation, (5) O&M Costs and (6) capex spread.

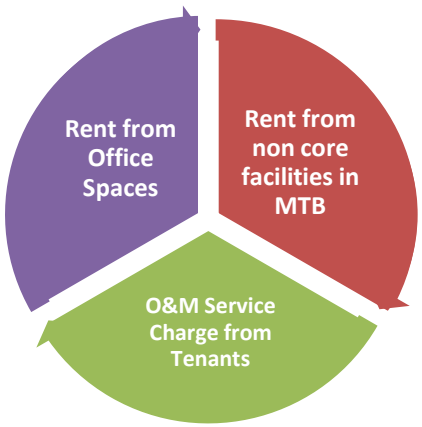
Debt Servicing Sheet

This worksheet sets out a consolidated summary of debt service stating separately the yearly amount of debt service of principal and interest in Bangladesh Taka. The computation of yearly principal, interest and total debt service is derived from capital cost, debt equity ratio and interest rate in each category loan. The debt service (interest + principal) of this sheet has link to the cash flow sheet and interest from this sheet is used as an input in the income statement sheet.

Revenue Sheet

This worksheet calculates the projected revenue of the PPP Investor from sources such as:

a. Rent from Industrial Plots
b. Rent from ICT units (office space)
c. Rent from commercial facilities such as Data Center, Banks, Food Court and Conference Hall
d. Service charge from tenants



Revenue is calculated based on the demand forecast and the lease rates. The output of the revenue sheet is processed in the income statement sheet to calculate the projected net income of the PPP Investor.

Depreciation Sheet

Depreciation sheet calculates the depreciation value of the assets yearly. The sheet takes data from project cost sheet and after computation, the depreciation expense from this sheet goes to the income statement.

O&M Costs Sheet

This sheet receives data from the input sheet and input support sheets regarding operation cost, maintenance cost and fixed costs of the project. The output of the O&M costs sheet is used in the income statement sheet to calculate the projected net profit of the business.

Capex Spread Sheet

The capex spread sheet is used for incorporating capital cost phasing of the project. Phasing of construction cost during construction is also projected in this sheet.

12.3.3 Financial Statements

Results of operating performance and financial position at periodic intervals are the essence of financial statements. The financial model provides projected financial statements such as, income statements and cash flow statements depicting profitability, liquidity and overall financial health of the entity. The result sheets include (1) Income Statement and (2) Cash Flow Analysis.

Income Statement

The financial model provides income statements for each year over the term of the PPP Agreement. The revenue stream over the years from commercial operations date is shown in the income statement. The statement also shows the operating expenses (fixed and variable), financing expenses and depreciation expenses as deductions from the revenues to obtain net income before tax. After deducting applicable tax, the net income for the equity holder is derived.

Cash Flow Analysis

Cash flow statement is an important financial output in the model, especially to arrive at the appropriate cash requirements of the project. The financial model incorporates the cash flow analysis for the project and determines the Project and Equity IRR and the DSCR for long-term liabilities. It will determine residual cash flow to equity after meeting all the expenses to determine return on equity, as residual surplus.

12.3.4 Result (Financial Indicator) Sheets

Summary Output Sheet

The key requirement for financial viability is that the business is able to earn profit and keep up sufficient cash flow that is sufficient to finance all necessary future investments.

Figure 12.4: Key Financial Indicators

This sheet gives the results of the model run in summarized form. The key results indicators are:

1. Internal Rate of Return (IRR) on capital employed in the total project and on equity. This is the ultimate parameter to determine the viability of the project.
2. Debt Service Coverage Ratio (DSCR)
    a. Maximum
    b. Average
    c. Minimum
3. Total Capital Payback Period
4. Equity Payback Period

Sensitivity Analysis Sheet

Sensitivity analysis is used to test the robustness of the results to variation in key inputs and project parameters. Cash flow as well as financial indicators depend on the interplay of several factors including capital cost, O&M cost and revenue and charges it earns from different category of services. It can be used to identify the values, if any, at which, preference for one option is switched to preference for another. Considering these variations of parameters, change of output /results is found through this analysis.

Scenario Analysis Sheet

The model incorporates different demand forecast scenarios. This sheet analyses the results of these scenarios in different combinations.

12.4 Business Model used in Financial Model

Different types of investment models for the project have been discussed in Chapter 9. The financial model has been prepared based on the perspective of the PPP Investor under a PPP model.

The Mohakhali ICT Village is envisaged to contain six different zones. They are:

- Zone 1: ICT Business Zone
- Zone 2: Hotel Business Zone
- Zone 3: Convention and Training Centers
- Zone 4: Residential Zone
- Zone 5: Recreational Zone
- Zone 6: Administrative Zone

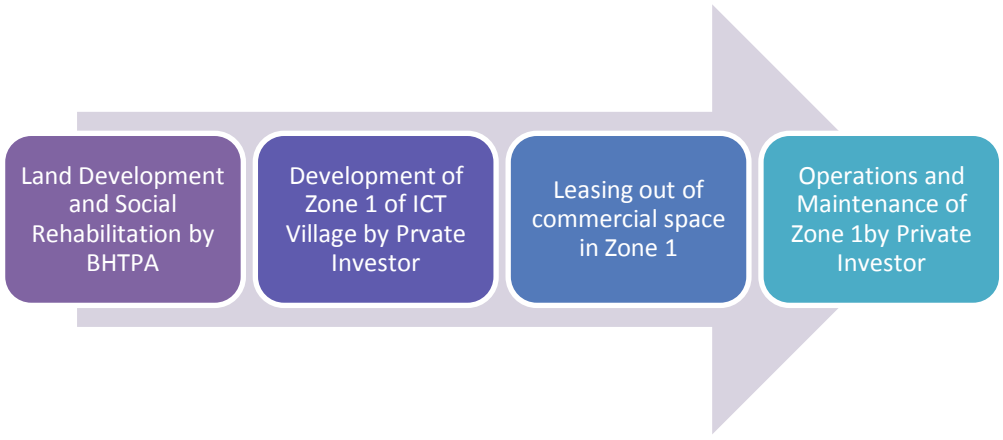
Under the PPP model, the PPP Investor will sign a PPP Contract with BHTPA, under which it will be responsible for development and operation of Zone 1: ICT Business Zone, including construction of Multi Tenant Buildings (MTBs) and construction of internal infrastructure such as internal roads, drains etc.

In addition, PPP Investor is envisaged to work closely with BHTPA in assisting the social rehabilitation of inhabitants of the project area by constructing economy housing or paying lumpsum cash depending on model of resettlement chosen.

In return for the right to use BHTPA's land the PPP Investor will pay Royalty to BHTPA, which will consist of a lumpsum upfront payment and variable royalty based on gross earnings. After end of Term, the O&M of Zone 1 of the ICT Village will be handed back to BHTPA (Figure 12.5).

Zone 2 – Zone 5 may be contracted out to other PPP Investors by BHTPA under separate agreements. Zone 6 will be developed by BHTPA with government fund. In addition, BHTPA will be responsible for regulation of the ICT village.

Figure 12.5: Business Model



In addition to the core business of leasing out office space, PPP Investor will also earn revenue from the following commercial facilities in the MTB:

- Banks
- Food Court

- Data Center
- Conference Hall

In addition to the commercial facilities, the following facilities will also be present in the MTBs:

- Administration office
- Research (R&D) area
- Gymnasium
- Meeting rooms

PPP Investor will also be responsible for maintenance of Zone 1 including security. PPP Investor will collect a monthly O&M charge from the tenants to this end, in addition to the lease charges.

12.5 Financial Model Parameters

The following sections describe the key parameters based on which the financial model has been designed.

12.5.1 Land Allocation

Assumptions made in regards to allocation of land in the ICT Village are shown in **Error! Reference source not found.** and described in more detail in Chapter 7. In addition to the ICT Business Zone and Residential Zone, the ICT Village will also have provisions for Hotels, Training and Convention Centers, Recreational Zone and Administrative Zone.

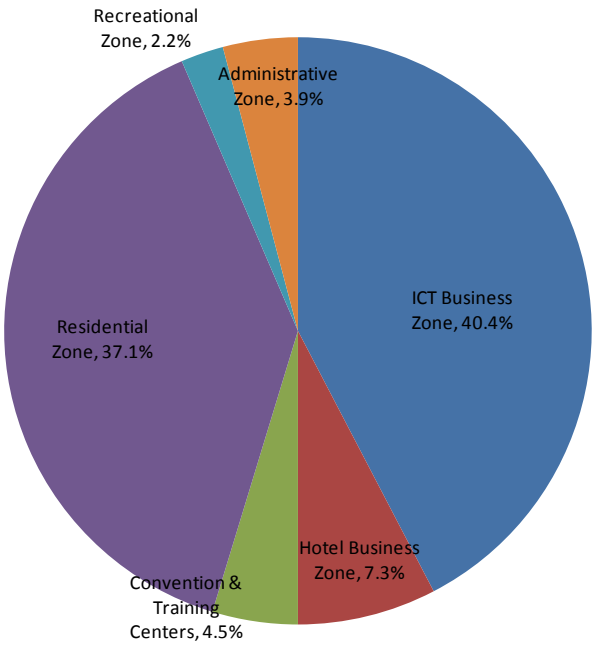
Table 12.1: Land Allocation

Land Allocation				
	Acres	*1,000 sft*	*% of Total*	
ICT Business Zone	18.00	784	*40.4%*	**Zone 1**
Hotel Business Zone	3.25	142	*7.3%*	**Zone 2**
Convention & Training Centers	2.00	87	*4.5%*	**Zone 3**
Residential Zone	16.50	719	*37.1%*	**Zone 4**
Recreational Zone	1.00	44	*2.2%*	**Zone 5**
Administrative Zone	1.75	76	*3.9%*	**Zone 6**
Main Road	2.00	87	*4.5%*	
Total	**44.50**	**1,938**	*100%*	

The ICT Village project site is approximately 44.50 acres, not including area currently under water. Out of the total area, 40% is allocated for ICT Business, 37% for residential housing and dormitories, 7% for hotels, 4.5% for training and convention centers, 2% for recreational zone and 4% for administrative facilities.

Breakdown of different zones in the ICT Village is shown in Figure 12.6.

Figure 12.6: Land Allocation in ICT Village



Buildings and structures that are envisaged to be located in the ICT Village is given in Table 12.2.

Table 12.2: Buildings in the ICT Village

Buildings					
Installation	Description				Total Area
	Zone	Size (sft)	Floors	Units	(sft)
Administrative Building	6	10,000	5	1	50,000
Gate House & Reception	6	3,000	2	1	6,000
Multi Tenant Building	1	50,000	30	2	3,000,000
Hotel Building	2	25,000	20	2	1,000,000
Training Centers	3	12,000	10	2	240,000
Convention Center	3	15,000	3	1	45,000
Residential Buildings	4	2,500	8	8	160,000
Dormitory Buildings	4	6,000	6	2	72,000
Amphitheater	5	10,000	1	1	10,000
Boat Club	5	10,000	2	1	20,000

ICT Units will be located in the two Multi Tenant Buildings in Zone 1 which will be the source of revenue for the PPP Investor.

12.5.2 Demand Forecast

The model has been used to assess the viability of developing the ICT Village using three different demand forecast scenarios explained in more detail in Chapter 6.

The three different scenarios analyzed are as follows:

Base Case: In the base case scenario, it is estimated that it will take **3 years** from commercial operations for all the available leasable area in the first Multi Tenant Building (MTB1) to be taken up by tenants. It will take another **6 years** for all the available leasable area in the second Multi Tenant Building (MTB2) to be taken up by tenants.

Optimistic Case: In the optimistic case scenario, it is estimated that it will take **2 years** from commercial operations for all the available leasable area in the first Multi Tenant Building (MTB1) to be taken up by tenants. It will take another **4 years** for all the available leasable area in the second Multi Tenant Building (MTB2) to be taken up by tenants.

Conservative Case: In the conservative case scenario, it is estimated that it will take **4 years** from commercial operations for all the available leasable area in the first Multi Tenant Building (MTB1) to be taken up by tenants. It will take another **11 years** for all the available leasable area in the second Multi Tenant Building (MTB2) to be taken up by tenants.

For each scenario, the financial analysis indicates the internal rate of return (IRR) of the project and allows for sensitivity analysis on costs and other factors to see their effect on the IRR.

Table 12.3 illustrates the demand forecasts used in the model (first 10 years shown).

Table 12.3: Demand Forecast Scenarios

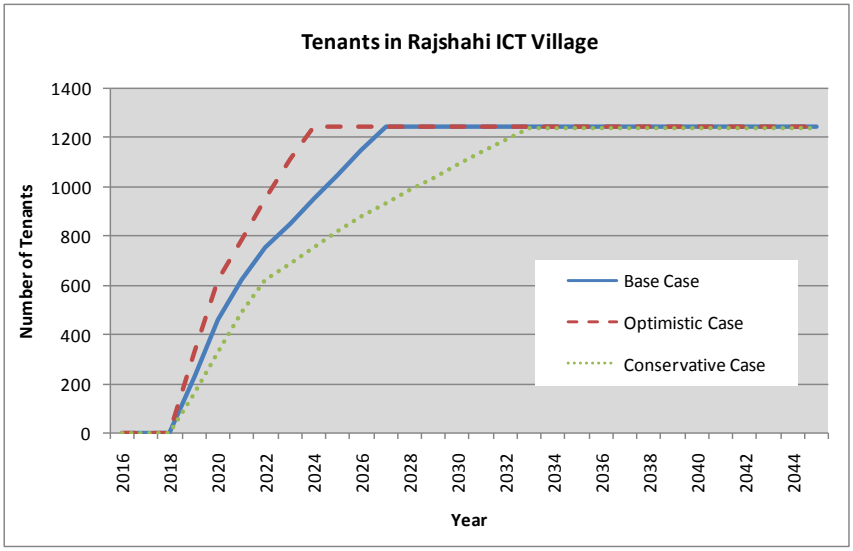
after COD

Yearly Percentage of Office Space Offtake			4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
	Base Case	MTB1	35%	35%	25%	0%	0%	0%	0%
		MTB2	0%	0%	0%	20%	15%	15%	15%
	Optimistic Case	MTB1	50%	45%	0%	0%	0%	0%	0%
		MTB2	0%	0%	25%	25%	25%	20%	0%
	Conservative Case	MTB1	25%	25%	25%	20%	0%	0%	0%
		MTB2	0%	0%	0%	0%	10%	10%	10%

12.5.3 Multi Tenant Buildings

It is estimated that a total of **657 ICT units** can be accomodated in each MTB. A total of **1,314 ICT units** can be accomodated in total in the two MTBs at full capacity. It will take 9 years after commercial operations of MTB1 for all leasable space in the MTBs to be filled by ICT units in the base case demand scenario. In the optimistic and conservative demand scenarios, it will take 6 years and 15 years respectively. Number of tenants in the MTB for the different scenarios is shown in Figure 12.7.

Figure 12.7: Number of Tenants in Different Scenarios

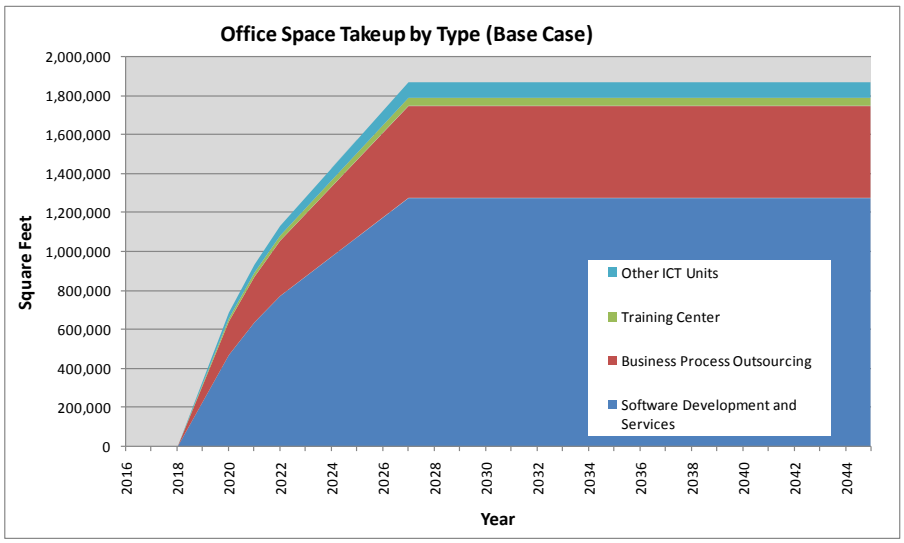


Demand forecast has indicated that four major types of ICT units will be located in the MTB. They are:

- Software Development and Services units,
- Business Process Outsourcing units,
- Training centers , and
- other ICT units.

Breakdown of the different types of units in the MTB in the base case scenario is shown in Figure 12.8.

Figure 12.8: Number of Units by Type in the Base Case Scenario

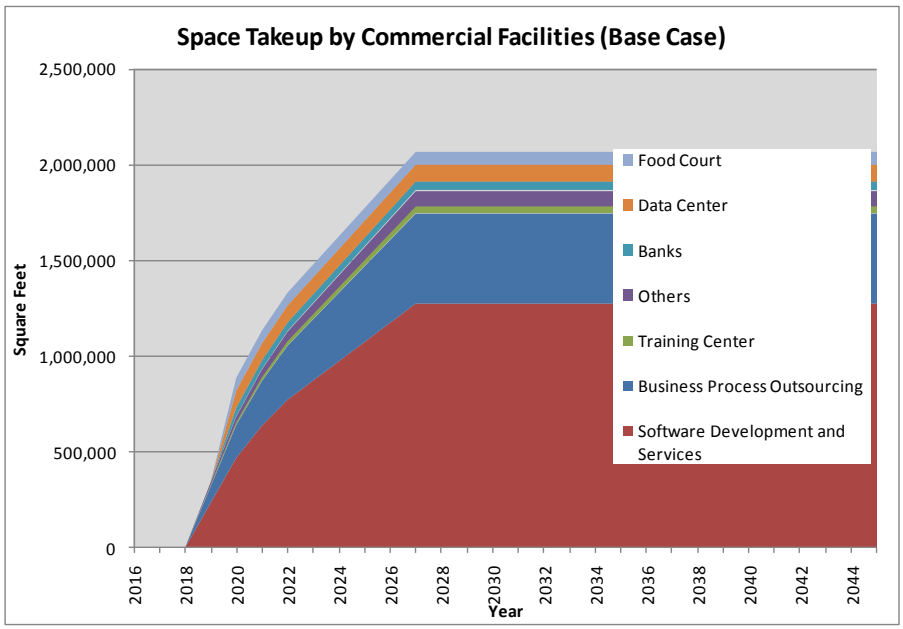


Breakdown of ICT units, by services, in the MTB in the base case scenario is shown in Table 12.4. Demand forecast indicates that all ICT units will require 1,500 sft of office space each.

Table 12.4: Breakdown of ICT units by Type in Base Case Scenario

Office Space Requirement	Type	*Office Size Requirements (sft)*	*Max. No. of units (MTB 1 and MTB 2)*	*Number of 500 sft offices*	*Number of 1,500 sft offices*
	Software Development and Services	1,500	***896***	0	896
	Business Process Outsourcing	1,500	***328***	0	328
	Training Center	1,500	***30***	0	30
	Others	1,500	***60***	0	60
			1,314 *Units*	**0**	**1,314**

Figure 12.9: MTB Space Takeup by Type



In addition to the office space demand, commercial facilities will also be commercially leased out after commercial operations. Space takeup of the MTB by different commercial facilities is shown in Figure 12.9.

Table 12.5 shows the land and space allocation for both core and non core businesses in the ICT Village.

Table 12.5: Space allocation in MTBs

Space Allocation in each MTB		
Multi Tenant Building (Blocks A, B and C)		
No. of Floors	30	
Area per floor	50,000	sft
Total Area	**1,500,000**	"
Software Development Area	672,000	sft
BPO offices (call centers)	246,400	"
Training Center	22,400	"
Other ICT Units	44,800	"
Data Center	89,600	"
Banks	44,800	"
Conference Hall	22,400	"
Food Court	67,200	"
Administration Offices	44,800	"
Meeting Rooms	22,400	"
Research (R&D) Area	44,800	"
Storage Room	11,200	"
Mosque	11,200	"
Common Space/ Utility Areas	156,000	"

12.5.4 Phasewise Development of Zone 1

Zone 1 of the ICT Village consists of two 30-storey MTB buildings. It is expected that the buildings will be built in two phases. Multi Tenant Building 1 (MTB1) will be constructed at land handover in Phase I. Internal roads and utilities will also be constructed in Phase I. Once 75% of the leasable spaces in MTB1 have been taken up construction of MTB2 will begin (Phase II).

Total leasable space in Phase I and Phase II is given in Table 12.6.

Table 12.6: Leasable Space in Zone 1

Leasable Space (Zone 1)		
Multi Tenant Building	***Phase I***	***Phase II***
Core Business	*sft*	*sft*
Software Development Area	672,000	672,000
BPO offices (call centers)	246,400	246,400
Training Center	22,400	22,400
Other ICT Units	44,800	44,800
Total Core Business	**985,600**	**985,600**
Non Core Business		
Data Center	89,600	89,600
Banks	44,800	44,800
Conference Hall	22,400	22,400
Food Court	67,200	67,200
Total Non Core Business	**224,000**	**224,000**
Total Leasable Space (Zone 1)	**1,209,600**	**1,209,600**

12.5.5 Capital Cost Estimate

Capital Cost estimate has been covered in detail in Chapter 8. The following tables illustrate the capital cost estimate used in the model. All cost estimates are in 2014 values.

Table 12.7: Hard Cost Estimate (Base Case)

Hard Cost						
		Units	*Area/Volume*	*Unit*	*Unit Cost (Tk/unit)*	*Total Cost (m Tk)*
Zone 1: ICT Business						
1	Multi Tenant Building (MTB)	2	1,500,000	sft	3,200	9,600
2	Internal Utilities (10% of civil cost)					960
3	HVAC Installations (10% of civil cost)					960
4	Onsite Infrastructure (5% of civil cost)					480
5	Internal Roads		31,150	sft	800	25
6	Internal Boundary Walls		3,450	ft	3,000	10
7	Landscaping		1	LS	1,000,000	1
	Sub-Total					**12,036**
	Contingent Expenditure	*5%*				602
Total Hard Cost						**12,638**

Table 12.8: Soft Cost Estimate (Base Case)

Soft Cost		m Tk	
Social Resettlement Cost		0	*Option V*
[1]Initial Working Capital		600	
[2]Project Management	4.5%	569	
Interest during Construction		763	
Total Soft Cost		**1,931**	

Table 12.9: Total Capital Cost Estimate (Base Case)

Total Capital Cost	m Tk
Hard Cost	12,638
Soft Cost	1931
Total Capital Cost	**14,570**

Total capital cost in the base case is estimated to be **Tk 14,570 million** (2014 Tk)**.**

The above cost estimate is based on the assumption that Social Resettlement Option V: Onsite Resettlement by PPP Investor is chosen. In that option, social resettlement cost for the project is zero as the PPP Investor will use the proceeds from his real estate business to pay for social resettlement. Social resettlement cost estimates for different Options is given in Table 12.10 and discussed in more detail in the Broad Resettlement Framework.

Table 12.10: Social Resettlement Cost Estimates

Resettlement Cost to be financed by Project	
	m Tk
Option I: Resettlement by Cash from GoB	0
Option II: Resettlement by Cash from PPP Investor	496
Option III: Off-site Resettlement by PPP Investor	1,304
Option IV: Off-site Resettlement by PPP Investor with Real Estate	0
Option V: On-site Resettlement by PPP Investor	0

If Option II or Option III is not chosen for social resettlement, the additional amounts given in the table above will be added to the capital cost estimate.

12.5.6 Spread of Capital Expenditure

The capex spread sheet incorporates the phasing of capital costs in the model. It is assumed that 30% of civil construction costs will be needed in Year 1, 50% in Year 2 and 20% in Year 3 for MTB1. Construction of MTB2 will start 2 years after start of construction of MTB1 (timeline estimated from demand forecast).

In the base case, it has been assumed that Social Resettlement Option V: Onsite Resettlement by PPP Investor is chosen. In Option V, PPP Investor will be required to construct housing facilities for current inhabitants of the project area. Construction of housing facilities and resettlement of inhabitants is expected to take approximately 4 years. Therefore, construction of MTB1 will begin 4 years after PPP Agreement signing (2019).

Table 12.11: Capex Spread

		Contract Year	Year 1	Year 2	Year 3	Year 4	Year 5
		Calendar Year	*2019*	*2020*	*2021*	*2022*	*2023*
Hard Cost							
Zone 1: ICT Business Zone							
Capex Spread for Civil Works	**Zone 1**		*30%*	*50%*	*20%*	*0%*	*0%*
			0%	*0%*	*30%*	*50%*	*20%*
Phase I Expenditure	m Tk		2,028	3,617	1,548	-	-
Phase II Expenditure	"		-	-	2,322	4,141	1,773
Total Hard Cost	m Tk		**2,028**	**3,617**	**3,871**	**4,141**	**1,773**
Soft Cost							
Social Resettlement Cost	m Tk						
Working Capital	"		600	-	-	-	-
Project Management	"		91	163	174	186	80
IDC	"		176	587	-	-	-
Total Soft Cost	m Tk		867	750	174	186	80
Total Capex	m Tk		**2,895**	**4,367**	**4,045**	**4,328**	**1,852**

Summary of the capital expenditure spread in the base case option is shown in Table 12.11. Capital cost escalation of 7% per annum has been estimated during calculation of the capital expenditure spread

12.5.7 Cost Escalation Estimates

Yearly cost escalation values estimated for all items are shown in Table 12.12.

Table 12.12: Cost Escalation Estimates

Escalation Factors		
Lease Rate Escalation	6%	per year
Capital Cost Escalation	7%	"
O&M Cost Escalation	8%	"
Salary Escalation	10%	"

Capital cost escalations have been estimated based on raw material cost increases in the last 10 years. Salary cost escalation has been based on inflation figures of the country over the last 10 years. Lease rate escalations have been estimated based on increase of living costs in cities over the last several years.

12.5.8 Operation and Maintenance Costs

Table 12.13 shows the parameters used in the model with regards to different types of operations and maintenance costs associated with the operation of Zone 1.

Maintenance costs associated with MTBs in Zone 1 is based on the amount of revenue generated from each building. The O&M cost will be higher if the buildings are in full capacity and lower if not all lesable spaces are taken up.

Maintenance of roads, sewerage system, stand-by generators, ICT infrastructure all have yearly operations and maintenance costs associated with them. Estimates on the amount of O&M cost has been made on the basis of investment. In addition to the internal infrastructure, there are also costs associated with the operations of the Zone such as landscaping, security etc. All such costs have been incorporated in the model.

Table 12.13: O&M Cost Items

Annual Operations and Maintenance Costs		
Buildings Maintenance	% of Revenue	10.0%
Roads Maintenance	% of capital cost	2.0%
Onsite Infrastructure	% of capital cost	2.0%
Internal Utilities	% of capital cost	2.0%
Landscaping	% of capital cost	5.0%
Security	200,000	Tk/ per month

The project company will need a set of dedicated staff to see to the operations of the Zone. It is estimated that manpower of 10 employees will be adequate for operations. Salary for dedicated staff is also included in the total O&M cost. Organogram along with estimated salary of the staff is given in Table 12.14.

Table 12.14: Management Structure

Management Structure	No. of employees	Avg. Salary/ month (Tk)	Avg. Salary/ year (m Tk)	Total (m Tk)
Top Management	1	125,000	1.50	1.50
Middle Management	2	50,000	0.60	1.20
Lower Management	2	30,000	0.36	0.72
Secretarial	5	15,000	0.18	0.90
				4.32

12.5.9 Depreciation

Depreciation is a non-cash expense. Though it does not directly influence cash flow, it influences tax obligations from income of the business, by offering tax savings adding to depreciation. Depreciation like interest is a tax deductible item considered by the tax authorities.

Basis of Depreciation

The Income Tax Ordinance, 1984 allows deduction of depreciation of assets from the income of the particular year to determine the taxable income for that period. Section 29(1) (VII) and (IX) of the Income Tax Ordinance provides provisions for the following methods of depreciation:

(a) Normal Depreciation

(b) Accelerated Depreciation

The ordinance also provides prescribed rates of depreciation irrespective of actual life of the assets. Normal Depreciation method is used in the model. It is briefly described in the following section.

Normal Depreciation

The Income Tax Ordinance 1984[5] prescribes the following depreciation schedule. The following table provides the prescribed rates for normal depreciation.

Table 12.15: Depreciation Schedule

Types of Assets	Depreciable amount as Percentage of written down value
Building (general)	10%
Factory building	20%
Furniture and fixture	10%
Machinery and plant (general rate)	20%

Each year, depreciation will be charged by the above prescribed percentage on the written down value *i.e.* the value of asset less accumulated depreciation in the previous years. In accounting concept, it is referred to as declining balance method. Depreciation each year will be reduced as the same percentage as applied on a declining balance. This method of depreciation has been used in the financial model as the base case, as the depreciation is mainly calculated for determining taxable income and thereby tax to be paid.

[5] Third Schedule, revised in 1998

	Depreciation Rates[6]
Building and Civil Construction	10%
Machinery and Equipment	20%

In the depreciation schedule, the above depreciable assets have been considered for tax purpose.

12.5.10 Corporate Tax Rate

PPP Investor will have to pay income taxes on 'Income from Business or Profession' as per the Income Tax Ordinance, 1984. The ordinance allows deductions from total income or revenue for cash and non-cash expenses (*i.e.* depreciation and amortization), to arrive at Net Income before Tax (NIBT). The applicable corporate tax rate is then applied to NIBT to derive income tax to be paid. As per Finance Act 2009 (anuchched Kha), Income Tax rate for the companies, which are not publicly traded, is **37.5%.** This rate has been used in the financial model for calculating the income tax payable to NBR.

12.6 Option C: Key Parameters and Financial Analysis (Base Case)

The base case investment model is **Option C: Concession PPP Model.** In the base case model it is assumed that resettlement Option V will be chosen by BHTPA. Key parameters and results of financial analysis of in the base case are presented in the following sections.

12.6.1 Business Model of Option C

Under Option C, BHTPA will handle the development of land and off-site infrastructure. BHTPA will also be responsible for social rehabilitation of inhabitants of the Karail area and handing over clear land to PPP Investor for development of Zone 1.

The PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. It will be responsible for implementing the project, which includes the development, financing, and construction of the core business facility (Zone 1). PPP Investor will also be responsible for operation and maintenance of Zone 1 of the ICT Village during the concession period. The concession period for this project is 30 years.

The PPP Investor will generate revenue by leasing out space to tenants. They will also make royalty payments to BHTPA for the right to use the land. At end of the concession period, the investor will return the land and facilities to the BHTPA at a depreciated value.

[6] Normal depreciation rates as per Income Tax Ordinance 1984, Third Schedule, revised in 1998

12.6.2 Key Model Parameters of Option C

Key parameters for financial analysis of Option C are presented in Table 12.16 and discussed in more detail in this chapter.

Table 12.16: Overview of Key Parameters in Option C

Category	Parameter
Investment Model	**Option C: Concession PPP Model**
Term	30 years from land handover
Resettlement Model	Option V: On-site Resettlement by PPP Investor
Social Resettlement Period	4 years
Construction Start	
Phase I	2019
Phase II	2021
Commercial Operation Date	
Phase I	2021
Phase II	2024
Land Area	44.5 acres
Leasable Area	
Zone 1	1.2 million sft
Number of ICT Units at the Village	1,314
Type of ICT units to be located at the ICT Village	• Software Development and Services • Business Process Outsourcing • Training Center • Other ICT services
Size of MTB office spaces for lease	1,500 sft
Lease Rates	
ICT Office Space, BPO offices and Training Centres	Tk 70 /sft/mon
Data Center, Cafeteria, Bank,	Tk 80 /sft/mon
Conference Hall	Tk 15,000 / day
Lease Rate Escalation	6% per year
O&M Service Charge	Tk 2.50 /sft/month
Royalty	Upfront: Tk 5 million Yearly: 2% of gross revenue
Tax Exmption	1st ten years

Category	Parameter
Debt/ Equity Ratio	75:25
Loan Component	80% IPFF Loan, 20% PFI loan (commercial banks)
Loan Term	
IPFF	20 years
PFI (Commercial Banks)	7 years
Grace Period for Loan Repayment	
IPFF	7 years
PFI (Commercial Banks)	3 years
Interest Rate	
IPFF	9.45%
PFI (Commercial Banks)	14.45%

12.6.3 Business Period

Financial analysis of the development of the ICT Village under Option C has been carried out for a period of **30 years** from handover of clear land to PPP Investor.

12.6.4 Project Timeline Estimates

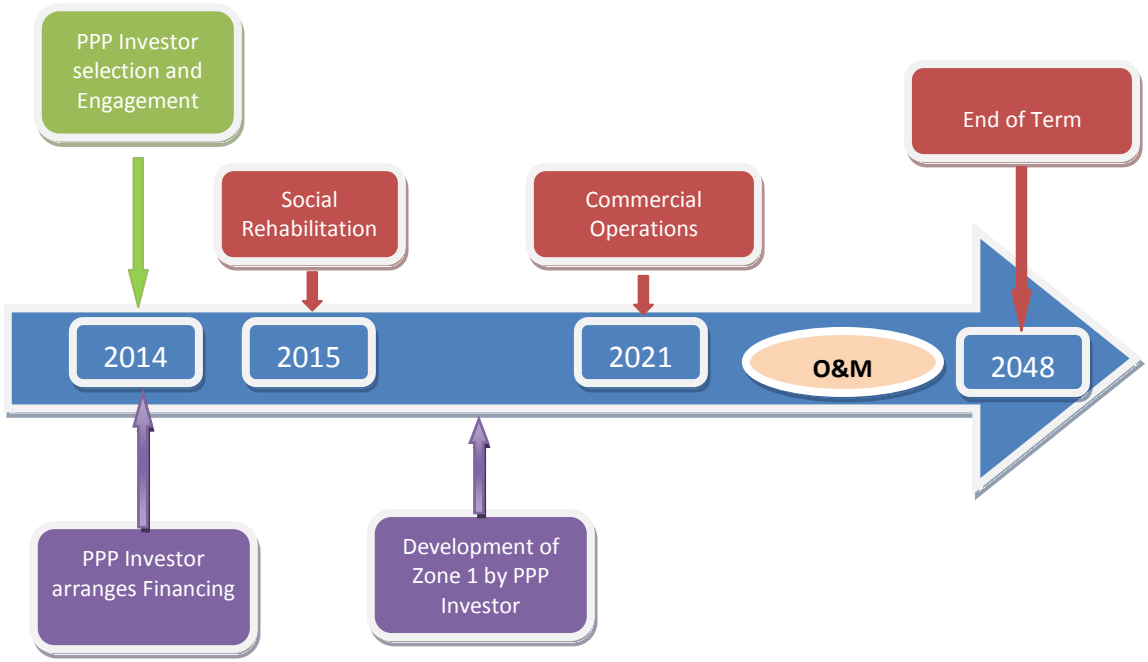
Estimates in the model with regards to the timeline of implementation of the project are given in Table 12.17.

Table 12.17: Project Timeline Estimates in Option C

Project Timeline		
Term	30	*years*
Construction Period	3	"
Contract Signing Date	2015	*January*
Social Rehabilation Period	4	*years*
Contract Effective Date	2019	
Zone 1: ICT Business Zone		
Construction Start		
Phase I	2019	
Phase II	2021	
Commercial Operations		
Phase I	2021	
Phase II	2024	

The investor selection process is estimated to take at least 6 months. In addition, it will require at least 6 months for the PPP Investor to secure loans for construction and for achieving financial closure. It is also estimated that four years will be required for resettlement of inhabitants at the project site including construction of economy housing, before construction of MTB may be commenced. As such, it is estimated that the construction of the MTB may be started by early 2019. A construction period of 3 years has been assumed. Commercial operations of Zone 1 is expected to be from early 2021 Figure 12.10.

Figure 12.10: Project Timeline under Option C



12.6.5 Source of Finance

The estimated capital cost, has been assumed to be financed by a debt to equity ratio of 75:25. Under this option, PPP Investor will need to invest equity in the amount of **Tk 4,372 million** and take loans in the amount of **Tk 13,116 million**. The debt component may be funded by the Investment Promotion Financing Facility (IPFF) which is the specialised funding mechanism for long term infrastructure PPP projects.

IPFF loan is available for a maximum of 80% of the debt portion of the project cost. The remaining 20% of the loan may be financed through commercial banks (PFIs).

A 20 years repayment period is assumed in the model for the IPFF loan and a 7 year repayment period for the commercial loan. It is also assumed that the

IPFF loan will allow a grace period of 7 years and the PFI loan will allow a 3 years grace period.

Table 12.18: Loan Assumptions in Option C

Financial Assumptions			
Debt	75%	*of Capital Cost*	
Equity	25%	"	
Company Income Tax Rate	37.5%		
Minimum Tax Rate	0.5%		
Loan			
IPFF		80%	
Loan term		20	*years*
Grace period		7	*years*
Yield of 364-day Treasure Bills		9.15%	
Interest Rate		9.45%	*(T-Bill rate + 30 basis points)*
PFI (Commercial Bank)		20%	
Loan term		7	*years*
Grace period		3	*years*
Margin of PFI		5%	
Interest Rate		14.45%	

IPFF guidelines stipulate a lending rate of the summation of Government 364 days T-Bill yield rate and 30 basis points. Government T-Bill rate is currently 9.15%. Interest rate for the IPFF loan will therefore be: 9.15% + .03% = **9.45%**

Margin of PFI has been assumed to be 5%. Interest rate on the PFI loan is therefore estimated to be: 9.45% + 5.0% = **14.45%**

12.6.6 Revenue Projection

PPP Investor's revenue is expected to be generated from the following sources:

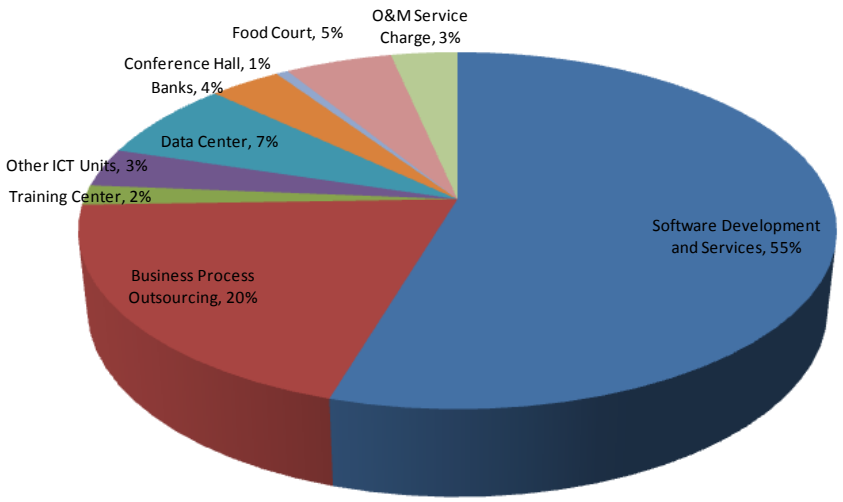
- Lease rentals from ICT Units in MTB in Zone 1:
  - ✓ Software Development and Services units
  - ✓ BPO units
  - ✓ Training centers
  - ✓ Other ICT units
- Other Commercial Facilities in Zone 1:
  - ✓ Data Center
  - ✓ Banks
  - ✓ Food Court
  - ✓ Conference Hall
- O&M Service Charge from Tenants

Approximate share of revenue for each revenue source is shown in Table 12.19 and Figure 12.11.

Table 12.19: Revenue Items in Option C

Facilities	Share of Revenue
Software Development and Services units	55%
BPO units	20%
Training Center	2%
Other ICT units	3%
Data Center	7%
Banks	4%
Conference Hall	1%
Food Court	5%
O&M Service Charge from Tenants	3%

Figure 12.11: Breakdown of Revenue Items in Option C



Revenue projection is derived from the demand forecast of space takeup in the MTBs and the lease rates for office spaces and other commercial facilities. O&M service charge is estimated on a per square feet basis. Estimates for lease rates and O&M service charges are provided in the following sections.

12.6.7 Lease Rates

PPP Investor will lease out ICT office spaces and commercial spaces in the MTBs and receive revenue. The lease rates estimated in the model are shown in Table 12.20.

Table 12.20: Lease Rates in Option C

Lease Rates		
Transitional Occupancy level (%)		95%
	Rent levels	
ICT Business Zone	*Tk/sft/mon (2014 Tk)*	*Tk/sft/yr*
Office Space	*70.00*	840.00
Training Center	*70.00*	840.00
Data Center	*80.00*	960.00
Banks	*80.00*	960.00
Food Court	*80.00*	960.00
Conference Hall	15,000	*Tk/day*

The lease rates for the office and commercial spaces have been based on the lease rates of similar facilities in Mohakhali. Market survey for the project in Dhaka demonstrated that ICT firms currently pay approximately Tk 55/sft/month as rent for their offices. Since the MTBs will offer world-class standard facilities including key support facilities, it is estimated that the lease rate for offices in the ICT Village will be higher than commercial office rents in other parts of Dhaka.

It has been assumed that 95% of the leasable space will be taken up at full capacity. 5% of the leasable area is estimated to be transitional, i.e. in-between lease or unoccupied.

12.6.8 Royalty

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA's land for his business. Royalty payment will be in two forms:

- Upfront payment of **Tk 5 million** at signing of PPP Contract
- Yearly payment of **2% of Gross Revenue**

The upfront payment will be paid to BHTPA in 5 equal installments during the first five years.

12.6.9 O&M Service Charge

PPP Investor will charge monthly O&M Service Charge to the tenants for operations and maintenance of the facilities in the MTBs, in addition to lease rentals for office space and commercial space. The estimated O&M Service Charge rate is given in Table 12.21.

Table 12.21: O&M Service Charge Rate in Option C

Service Charges		
O&M Service Charge	2.50	Tk/sft/month

The O&M service charge will be collected for services such as:

- Landscaping
- Security
- Cleaning and maintenance
- Lobby and passage lighting

PPP Investor will be responsible for all operations and maintenance of the facilities in Zone 1 of the ICT Village.

12.7 Option C: Results of Financial Analysis

Key financial indicators of the project Under Option C are presented in Table 12.22 in terms of Bangladesh Taka, including the Equity IRR of the project, the project IRR, the project and equity payback periods and the debt service coverage ratios.

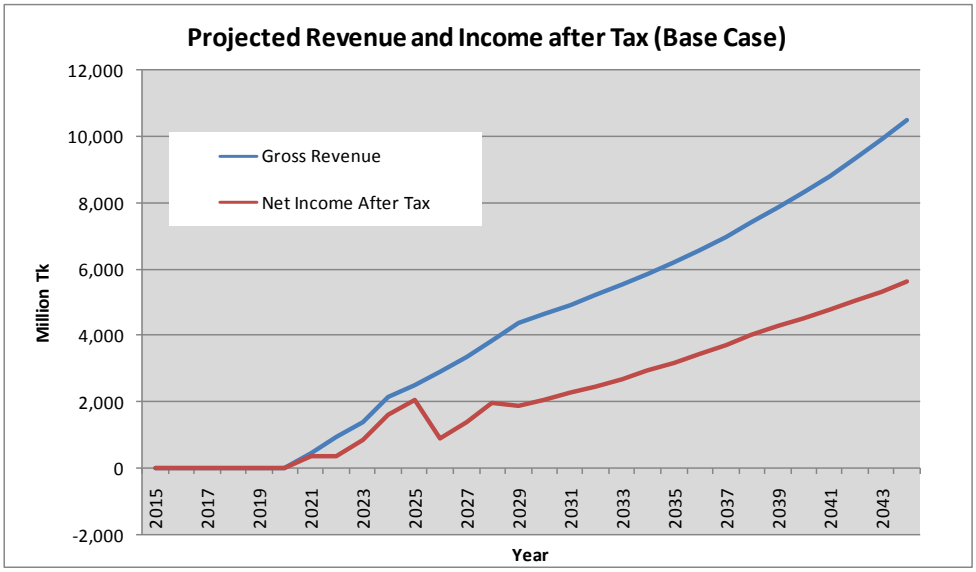
Table 12.22: Key Financial Indicators under Option C

Output	
Equity IRR	**15.39%**
Project IRR	**11.81%**
Royalty Received by Government	
First 10 years (mil Tk)	**356**
Full Term of Contract (mil Tk)	**3,583**
DSCR	
Average	**1.62**
Maximum	2.87
Minimum	0.63
Equity Payback Period (year)	**13**
Project Payback Period (year)	**11**

BHTPA will receive Royalty from the PPP Investor in the amount of Tk 356 million in the first 10 years and Tk 3,583 million over the 30 year term, under the base case model.

Figure 12.12 shows the projected revenue and income after tax of the business.

Figure 12.12: Projected Revenue and Income Business



12.7.1 Return from the Project

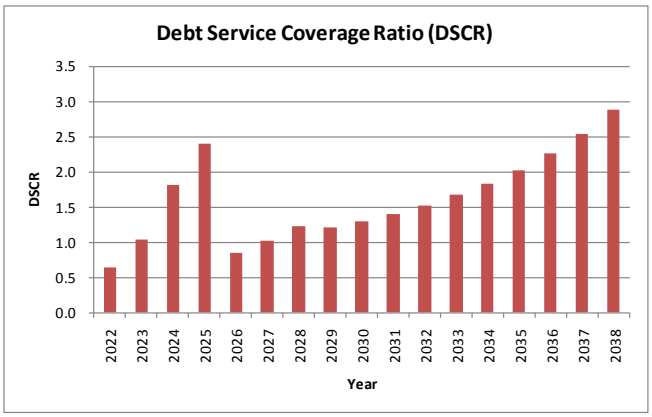
The internal rate of return (IRR) on a project is the annualized effective compounded return rate or discount rate that makes the net present value of all cash flows from the project equal to zero. Internal rates of return give an indication on the desirability of investments or projects. The higher a project's IRR, the more desirable it is to undertake the project.

The equity IRR of the project is calculated from the projected cash flow to the equity holder (in this case BHTPA). Financial analysis shows that Investment in the project will provide a return of 11.8% and a **return of 15.4% on equity**. It will take 11 years for investment payback, with equity payback occuring in 13 years.

Equity IRR of approximately 15% indicates that the project may not be financially viable for private investment under Option C.

12.7.2 Debt Service Coverage Ratio (DSCR)

Figure 12.13: DSCR of the Project in Base Case



The debt service coverage ratio (DSCR) is the ratio of cash available for debt servicing to interest, principal and lease payments. It is used in the measurement of an entity's ability to produce enough cash to cover its debt payments. The higher this ratio is, the easier it is to obtain a loan. Typically, most commercial banks require a DSCR ratio of above 1.50 to ensure that sufficient cash flow to cover loan payments is available on an ongoing basis. A project having a debt coverage ratio of more than 1.50 indicates that the project generates enough revenue to cover annual debt payments.

The DSCR of the project is shown in Figure 12.13 The average DSCR is **1.62** which indicates that the project will generate enough revenue to cover loan payments.

12.7.3 Demand Scenario Analysis

The financial model was used to model three different scenarios, including the base case scenario, of different combinations of space demand projections. The three demand forecast scenarios are as follows:

Space Offtake (MTB)		
	Space offtake period (yrs)	
	MTB1	MTB2
Base Case	3	6
Optimistic Case	2	4
Conservative Case	4	11

Results of the financial analysis of the different scenarios are given in Table 12.13.

Table 12.23: Results of Demand Scenario Analysis in Option C

Equity IRR	Option C
Base Case	**15.4%**
Optimistic Case	20.3%
Conservative Case	11.0%
Project IRR	
Base Case	**11.8%**
Optimistic Case	13.5%
Conservative Case	9.9%
Average DSCR	
Base Case	**1.62**
Optimistic Case	1.75
Conservative Case	1.47
Equity Payback Period	
Base Case	**13**
Optimistic Case	9
Conservative Case	16
Project Payback Period	
Base Case	**11**
Optimistic Case	10
Conservative Case	12

Scenario analysis of different options demonstrates that the difference in financial indicators in the base case and optimistic case is not very high. Therefore, the financial health of the project is not very highly dependent on the rate of space takeup in the ICT Village but in other factors such as lease rates, capital cost etc.

12.8 Sensitivity Analysis

Various factors affect the equity IRR of the project. In order to understand the importance of each factor in determining the viability of the project, it is important to carry out a sensitivity analysis. The following factors have been analyzed for examining their impact on the internal rate of return:

- Capital Cost
- O&M Cost
- Lease Rates
- Interest Rate

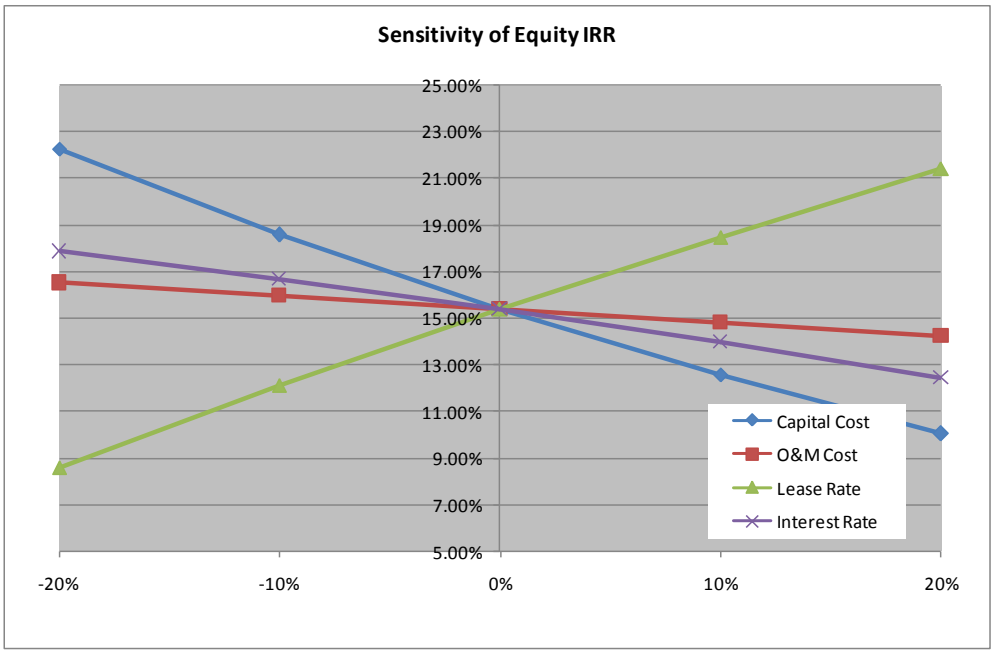
Each of the above factors was varied by 10% in both directions and the effect

on the equity IRR observed. The result is shown in Table 12.14 and Figure 12.14.

Table 12.24: Equity IRR Sensitivity

Equity IRR Sensitivity	-20%	-10%	0%	10%	20%
Capital Cost	22.3%	18.6%	**15.4%**	12.6%	10.0%
O&M Cost	16.5%	16.0%	**15.4%**	14.8%	14.2%
Lease Rate	8.6%	12.1%	**15.4%**	18.5%	21.4%
Interest Rate	17.9%	16.7%	**15.4%**	14.0%	12.4%

Figure 12.14: Equity IRR Sensitivity



The sensitivity diagram plots the changes in equity IRR for slight changes in selected parameters. Higher the slope of line corresponding to each parameter, higher is the sensitivity of equity IRR; i.e. higher slope indicates that changes in that parameter has bigger impact on IRR.

From the above figure, it can seen that Capital Cost of the project has the biggest impact on the return of the project. Higher the capital cost, lower is the return for the project. Therefore, it is important that the capital cost for the project is budgeted carefully. It is also important to ensure that construction period overruns do not take place as the longer it takes to complete construction, higher the capital cost of the project will be

After lease rates, Lease Rates have the biggest impact to rate of return in the project. Higher the Lease Rates, higher is the equity IRR. However, increasing the lease rates to levels very high above the local market rates will have an impact on demand for space in the MTBs and hence negatively affect the IRR. Therefore, lease rates for office spaces needs to fixed keeping in mind both the demand and financial viability.

12.9 Option D: Key Parameters and Financial Analysis

Financial analysis of **Option D: PPP Concession Model with VGF** was also conducted. Key parameters and results of financial analysis of Option D are presented in the following sections.

12.9.1 Business Model of Option D

Under Option D, BHTPA will handle the development of land and off-site infrastructure and rehabilitation of inhabitants of the project site. The PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. It will be responsible for implementing the project, which includes the development, financing, and construction of Zone 1 including the Multi-Tenant Buildings, as well as the operation and maintenance of Zone 1 during the concession period. The concession period for this project is 50 years. Since the financial viability of the project is not ensured, Viability Gap Funding (VGF) in the amount of 30% of the estimated project cost will be provided by the Government to the PPP Investor.

The PPP Investor will generate revenue by leasing out space to tenants. They will also make royalty payments to BHTPA for the right to use the land. At end of the concession period, the investor will return the land and facilities to the BHTPA at a depreciated value.

12.9.2 Key Model Parameters of Option D

Key parameters for financial analysis of Option E are presented in Table 12. 25 and discussed in more detail in this chapter.

Table 12.25: Overview of Key Parameters in Option E

Category	Parameter
Investment Model	**Option D: PPP Concession Model with VGF**
Term	50 years from start of construction
Construction Start	
Phase I	2019
Phase II	2021
Commercial Operation Date	
Phase I	2021
Phase II	2024
Land Area	44.5 acres
Number of ICT Units at the Village	1,314
Type of ICT units to be located at the ICT Village	• Software Development and Services • Business Process Outsourcing

Category	Parameter
	• Training Center • Other ICT services
Size of MTB office spaces	1,500 sft
Lease Rates	
ICT Office Space, BPO offices and Training Centres	Tk 70/sft/mon
Data Center, Bank,	Tk 80/sft/mon
Food Court	Tk 80/sft/mon
Conference Hall	Tk 15,000 / day
O&M Service Charge	Tk 2.50 /sft/month
Loan Component	80% IPFF Loan, 20% PFI loan (commercial banks)
Royalty	Upfront: Tk 5 million Yearly: 2% of gross revenue

12.9.3 Business Period

Financial analysis of the development of Zone 1 of the ICT Village under Option D has been carried out for a period of **50 years** from start of construction of the MTBs.

12.9.4 Project Timeline Estimates

Estimates in the model with regards to the timeline of implementation of the project are given in Table 12.26.

Table 12.26: Project Timeline Estimate in Option D

Project Timeline		
Term	50	*years*
Construction Period	3	"
Contract Signing Date	2015	*January*
Social Rehabilation Period	4	*years*
Contract Effective Date	2019	
Zone 1: ICT Business Zone		
Construction Start		
Phase I	2019	
Phase II	2021	
Commercial Operations		
Phase I	2021	
Phase II	2024	

12.9.5 Source of Finance

Viability Gap Funding

Viability Gap Funding (VGF) is meant as a grant for PPP projects where financial viability is weak but economic and social viability is high. If the project needs capital assistance, Government may provide VGF as capital grant as provided for in the Government's current budget, assisting the PPP Investor in bridging the viability gap of the project. As per the Policy and Strategy for Public-Private Partnership (PPP) 2010, VGF is to be managed by the Finance Division and is for disbursement to the PPP project company, upon request by the line ministry / implementing agency.

Under Option D, it has been estimated that VGF will cover thirty percent (30%) of the estimated project cost. VGF will be payable by the government to the PPP Investor in three equal annual payments payable during the construction period.

Total amount of VGF payable by the Government under this model is **Tk 4,371 million**, with Tk 1,457 million disbursed annually for the first 3 years on construction.

Private Sector Financing

The estimated capital cost, less the VGF amount, has been assumed to be financed by a debt to equity ratio of 75:25. Under this option, PPP Investor will need to invest equity in the amount of **Tk 3,279 million** and take loans in the amount of **Tk 9,837 million**. The debt component may be funded by the

Investment Promotion Financing Facility (IPFF) which is the specialised funding mechanism for long term infrastructure PPP projects.

IPFF loan is available for a maximum of 80% of the debt portion of the project cost. The remaining 20% of the loan may be financed through commercial banks (PFIs).

A 20 years repayment period is assumed in the model for the IPFF loan and a 7 year repayment period for the commercial loan. It is also assumed that the IPFF loan will allow a grace period of 7 years and the PFI loan will allow a 3 years grace period.

Table 12.27: Loan Assumptions in Option D

Financial Assumptions			
Debt	75%	*of Capital Cost*	
Equity	25%	"	
Company Income Tax Rate	37.5%		
Minimum Tax Rate	0.5%		
Loan			
IPFF		80%	
Loan term		20	*years*
Grace period		7	*years*
Yield of 364-day Treasure Bills		9.15%	
Interest Rate		9.45%	*(T-Bill rate + 30 basis points)*
PFI (Commercial Bank)		20%	
Loan term		7	*years*
Grace period		3	*years*
Margin of PFI		5%	
Interest Rate		14.45%	

IPFF guidelines stipulate a lending rate of the summation of Government 364 days T-Bill yield rate and 30 basis points. Government T-Bill rate is currently 9.15%. Interest rate for the IPFF loan will therefore be: 9.15% + .03% = **9.45%**

Margin of PFI has been assumed to be 5%. Interest rate on the PFI loan is therefore estimated to be: 9.45% + 5.0% = **14.45%**

12.9.6 Royalty

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA land for his business. Royalty payment will be in two forms:

- Upfront payment of Tk 5 million at signing of PPP Contract
- Yearly payment of 2% of Gross Revenue

The upfront payment will be paid to BHTPA in 5 equal installments during the first five years.

12.10 Option D: Results of Financial Analysis

Key financial indicators of the project Under Option D are presented in Table 12.28 in terms of Bangladesh Taka, including the Equity IRR of the project, the project IRR, the project and equity payback periods and the debt service coverage ratios.

Table 12.28: Key Financial Indicators under Option D

Output	
Equity IRR	**27.18%**
Project IRR	**18.37%**
Royalty Received by Government	
First 10 years (mil Tk)	**356**
Full Term of Contract (mil Tk)	**13,932**
DSCR	
Average	**2.14**
Maximum	3.82
Minimum	0.85
Equity Payback Period (year)	**8**
Project Payback Period (year)	**9**

Implementing the project under Option D gives a 27% return on Equity which is much higher than in Option C. However, significant Government funding in the form of VGF is required.

12.11 Option E: Key Parameters and Financial Analysis

Financial analysis of **Option E: Leasehold Transfer Model** was also conducted. Key parameters and results of financial analysis of Option E are presented in the following sections.

12.11.1 Business Model of Option E

Under Option E: Leasehold Transfer Model, the PPP Investor is allowed to transfer the leaseholdings of the built-up office spaces to individual businesses before and during construction of the MTB. In this model, the PPP Investor will have a 10 year Term from signing of Contract and will be allowed to transfer leaseholdings of the built-up space to individual businesses for long term leases. The businesses will pay a one-time Leasehold Transfer amount to PPP Investor and will pay yearly service charges to the PPP Investor of the MTB, which will be PPP Investor during its 10 year term and afterwards will be BHTPA.

12.11.2 Key Model Parameters of Option E

Key parameters for financial analysis of Option E are presented in Table 12. 29 and discussed in more detail in this chapter.

Table 12.29: Overview of Key Parameters in Option E

Category	Parameter
Investment Model	**Option E: Leasehold Transfer Model**
Term	10 years from start of construction
Construction Start	
Phase I	2019
Phase II	2021
Commercial Operation Date	
Phase I	2021
Phase II	2024
Land Area	44.5 acres
Number of ICT Units at the Village	1,314
Type of ICT units to be located at the ICT Village	• Software Development and Services • Business Process Outsourcing • Training Center • Other ICT services
Size of MTB office spaces	1,500 sft
Leasehold Transfer Rates	
ICT Office Space, BPO offices and	Tk 12,000/sft

Category	Parameter
Training Centres	
Data Center, Bank,	Tk 15,000 /sft
Food Court	Tk 12,000 /sft
Conference Hall	Tk 7,000 / sft
O&M Service Charge	Tk 2.50 /sft/month
Loan amount	None
Royalty	Upfront: Tk 500 million Yearly: 5% of gross revenue

12.11.3 Business Period

Financial analysis of the development of Zone 1 of the ICT Village under Option E has been carried out for a period of **10 years** from start of construction of the Park.

12.11.4 Project Timeline Estimates

Estimates in the model with regards to the timeline of implementation of the project are given in Table 12.30.

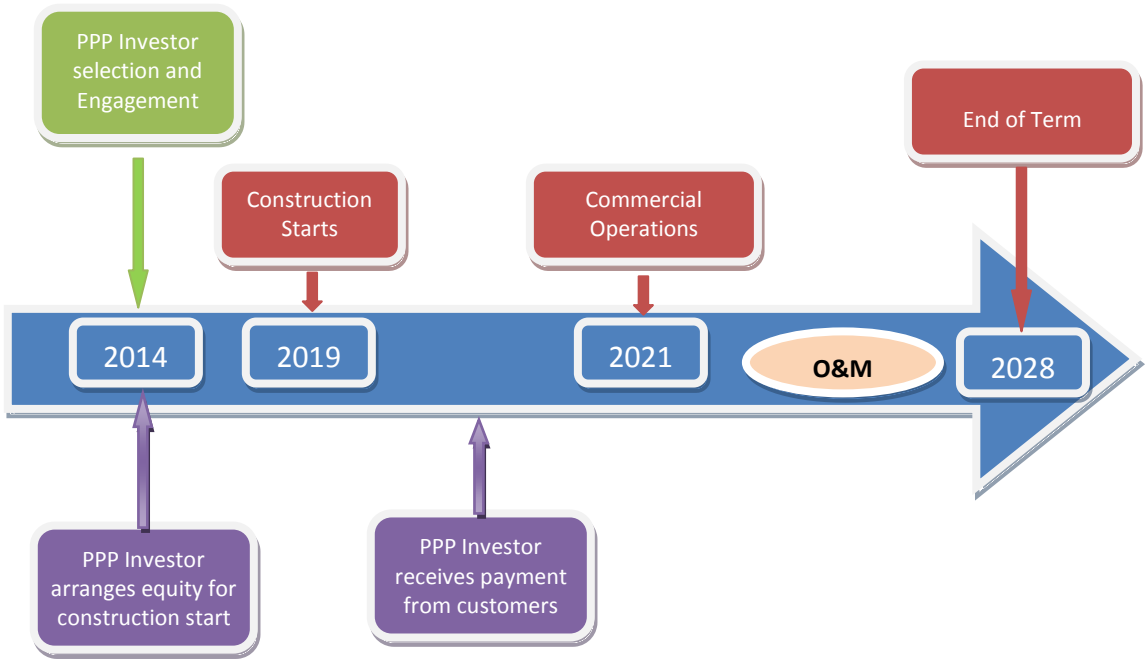
Table 12.30: Project Timeline Estimate in Option E

Project Timeline		
Term	10	*years*
Construction Period	3	"
Contract Signing Date	2015	*January*
Social Rehabilation Period	4	*years*
Contract Effective Date	2019	
Zone 1: ICT Business Zone		
Construction Start		
Phase I	2019	
Phase II	2021	
Commercial Operations		
Phase I	2021	
Phase II	2024	

The investor is expected to start transferring leaseholdings of the commercial spaces as sson as construction of the MTB starts. PPP Investor will be transferring all the leaseholdings within 10 years of commercial operations

and also be responsible for operation and maintenance of the MTBs during this period (Figure 12.15).

Figure 12.15: Project Timeline under Option E



12.11.5 Source of Finance

The PPP Investor will be receiving upfront payments by trasferring leaseholdings during the construction of the MTBs. As such he will not be required to take loans as in Option C, and will be able to recover the cost of the construction through his own equity and the money received from upfront payments by customers. This model allows the PPP Investor to save on interest payments as he is not required to take large amounts of loan for construction.

12.11.6 Demand Forecast for Option E

In Option E, demand for space is expected to be higher than in Option C as business owners are more comfortable with long term leases. In addition, PPP Investor will not need to take any loans as he will receive upfront payments from customers during construction. This will save interest expenses for the investor increasing financial viability.

Three different demand scenarios were considered and the space takeup for each scenario is presented in Table 12.31.

Table 12.31: Demand Forecast for Space in Option E

			Construction Start			after COD					
Yearly Percentage of Office Space Offtake			1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr
	Base Case	MTB1	0%	35%	35%	25%	0%	0%	0%	0%	0%
		MTB2	0%	0%	0%	20%	15%	15%	15%	15%	15%
	Optimistic Case	MTB1	5%	40%	50%	0%	0%	0%	0%	0%	0%
		MTB2	0%	0%	25%	25%	25%	20%	0%	0%	0%
	Conservative Case	MTB1	0%	25%	25%	25%	20%	0%	0%	0%	0%
		MTB2	0%	0%	0%	15%	15%	15%	15%	15%	10%

In the base case demand scenario, it is estimated that space takeup will start in the second year of construction and all spaces in MTB1 will be taken up by Year 4 of Contract signing. In the optimistic case scenario it is assumed that space takeup will start in Year 1 and all spaces in MTB1 will be taken up by Year 3. In the conservative case scenario it is estimated that it will take 5 years for space takeup in MTB1.

12.11.7 Revenue Projection

PPP Investor's revenue is expected to be generated from the following sources:

- Leasehold Transfer amounts from ICT Units in MTB:
  - ✓ Software Development and Services units
  - ✓ BPO units
  - ✓ Training centers
  - ✓ Other ICT units
- Leasehold Transfer amounts from other Commercial Facilities in MTB:
  - ✓ Data Center
  - ✓ Banks
  - ✓ Food Court
  - ✓ Conference Hall
- O&M Service Charge from Tenants

Revenue projection is derived from the demand forecast of space in the MTBs and the leasehold transfer rates for commercial facilities. O&M service charge is estimated on a per square feet basis.

12.11.8 Leasehold Transfer Rates

The one-time payment value for transfer of leases has been estimated based on office and commercial space sale values in the Mohakhali region. The estimated values used for financial analysis is presented in Table 12.32.

Table 12.32: Leasehold Transfer Rates

Leasehold Transfer Rates (Option E)	
	Tk/sft
Office Space	*12,000*
Training Center	*12,000*
Data Center	*15,000*
Banks	*15,000*
Food Court	*12,000*
Conference Hall	*7,000*

12.11.9 Royalty

The PPP Investor will pay Royalty to BHTPA for the right to use BHTPA land for his business. Royalty payment will be in two forms:

- Upfront payment of Tk 500 million at signing of PPP Contract
- Yearly payment of 5% of Gross Revenue

Royalty payment amount to BHTPA will be much higher in this model than the Option C as the PPP Investor will be receiving large sums of money upfront by transferring the leaseholdings to individual customers.

12.12 Option E: Results of Financial Analysis

Key financial indicators of the project Under Option E are presented in Table 12.33 in terms of Bangladesh Taka, including the Equity IRR of the project, the project IRR, the project and equity payback periods and the debt service coverage ratios.

Table 12.33: Key Financial Indicators under Option E

Output	
Equity IRR	**41.26%**
Project IRR	**41.26%**
Royalty Received by Government	
First 10 years (mil Tk)	**2,175**
Full Term of Contract (mil Tk)	**2,175**
Equity Payback Period (year)	**3**
Project Payback Period (year)	**3**

Implementing the project under Option E gives a 41% return on Equity which is much higher than in Option C. Equity payback period is also only 3 years which indicates that this model of investment will be very attractive for PPP Investors. In adition, BHTPA will be receiving Tk 500 million upfront as royalty compared to only Tk 5 million upfront-payment in Option C. Implementing the project under Option E will also result in BHTPA receiving a total royalty of Tk 2,175 million within the first 10 years as compared to only Tk 356 million under Option C.

12.13 Scenario Analysis

The financial model has been used to analyse different scenarios for implementation of the project.

Three demand scenarios were considered: (i) Base Case, (ii) Optimistic Case, and (iii) Conservative Case.

Three PPP investment options were considered: (i) Option C: Concession PPP Model, (ii) Option D: PPP Concession Model with VGF, and (iii) Leasehold Transfer Model.

Five resettlement options were considered: (i) Resettlement by Cash from GoB, (ii) Resettlement by Cash from PPP Investor, (iii) Option III: Offsite Resettlement by PPP Investor, (iv) Option IV: Offsite Resettlement by PPP Investor with Real Estate, and (v) Option V: Onsite Resettlement by PPP Investor.

Fiancial analysis results of the different scenarios is presented in Table 12.34 and Table 12.35.

Table 12.34: Scenario Analysis Results (Resettlement Option V)

Equity IRR	Option C	Option D	Option E
Base Case	**15.4%**	**27.2%**	**41.3%**
Optimistic Case	20.3%	35.3%	49.3%
Conservative Case	11.0%	21.7%	31.4%
Project IRR			
Base Case	**11.8%**	**18.4%**	**41.3%**
Optimistic Case	13.5%	20.2%	49.3%
Conservative Case	9.9%	16.6%	31.4%
Average DSCR			
Base Case	**1.62**	**2.14**	**0.00**
Optimistic Case	1.75	2.31	0.00
Conservative Case	1.47	1.94	0.00
Equity Payback Period			
Base Case	**13**	**8**	**3**
Optimistic Case	9	6	3
Conservative Case	16	11	4
Project Payback Period			
Base Case	**11**	**9**	**3**
Optimistic Case	10	9	3
Conservative Case	12	11	4

Table 12.35: Scenario Analysis Results (Base Case demand)

Equity IRR	Investment Options		
	Option C	Option D	Option E
Social Resettlement Options			
Option I	11.4%	20.8%	53.9%
Option II	10.4%	20.0%	39.7%
Option III	12.5%	22.4%	12.3%
Option IV	15.4%	27.2%	41.3%
Option V	**15.4%**	27.2%	41.3%
Project IRR			
Option I	10.6%	15.7%	53.9%
Option II	10.0%	15.3%	39.7%
Option III	10.1%	16.1%	12.3%
Option IV	11.8%	18.4%	41.3%
Option V	**11.8%**	18.4%	41.3%
Average DSCR			
Option I	1.43	1.89	0.00
Option II	1.39	1.84	0.00
Option III	1.52	2.01	0.00
Option IV	1.62	2.14	0.00
Option V	**1.62**	2.14	0.00
Equity Payback Period			
Option I	16	12	4
Option II	17	12	4
Option III	19	13	8
Option IV	13	8	3
Option V	**13**	8	3
Project Payback Period			
Option I	13	11	4
Option II	13	11	4
Option III	15	14	8
Option IV	11	9	3
Option V	**11**	9	3

Financial analysis results of demand scenarios and investment options indicate that investment Option D and investment Option E is viable. However, Option E will be more attractive to PPP Investors compared to Option D.

Results also indicate that project will be financially viable if Resettlement Option IV or V is chosen. Resettlement options I, II or III are only viable if VGF is provided by Government or Option D is chosen as the investment model.

12.14 Economic Benefits

Establishment of ICT village will be significantly beneficial to establish knowledge based hi-tech industries in software, hardware, IT enabled services. This project will also create new employment opportunities and promote micro, small and medium local entrepreneurs, international ICT companies in order to contribute to boost up the national economy. This project is also expected to have a positive impact in GDP growth rate and reduction poverty. This section highlights some of the economic benefits to the executing agency, BHTPA and the nation.

Implementation of social resettlement project through cooperation agreement will ensure the concept of benefit sharing which is the way to improve the livelihood of the resettled persons and the society.

12.14.1 Benefits to the Nation

1. Employment Opportunities

It is expected that ICT Village will generate employment opportunities of 30,000 individuals through establishment of two Multi Tenant Buildings (MTBs).

In addition, it is also expected that ICT Village will create a number of significant indirect employment generation from other establishments i.e. hotel business, convention & training centers and others.

In our country, a good number of IT Degree/Diploma holders graduate who are vital to the software development capability of the industry. Therefore, implementation of the project will be beneficial to IT graduates and to the ICT industry in the country.

2. ICT Companies

Development of the ICT village will generate involvement of large national and international companies who will render inward investment by creating world-class, world-scale physical facilities and proactive support services. Four major types of ICT units are considered: Software Development and Services units, Business Process Outsourcing units, Training centers, and Other ICT units.

It is estimated that a total of 657 ICT units can be accommodated in each MTB. A total of 1,314 ICT units can be accommodated in total in the two MTBs at full capacity.

3. Revenue Generation from Commercial Facilities

It is estimated that under Option C Concession PPP Model (BOT), PPP investor will earn about **Tk. 180 billion** of revenue from the MTBs which include ICT offices, Banks, Food Court, Data Center and Conference Hall over a period of 30 years.

4. Livelihood Improvement of the Resettled Persons and the Society

In addition to the restoration and improvement of livelihoods, resettlement may provide opportunities to an affected community to improve housing, public infrastructure, and services and to engage in land use planning that contributes to the long-term development objectives of individuals and the community as a whole. The social resettlement project will provide the affected population with the opportunity to move from slum to economy housing with water, sewerage, gas, electricity, and paved access. These opportunities will be provided to inhabitants considering on chosen of any resettlement options from Option III: Off-site Resettlement by PPP Investor, Option IV: Off-site Resettlement by PPP Investor with Real Estate, Option V: On-site Resettlement by PPP Investor and Option VI: Resettlement of Entire Karail Area by PPP Investor.

5. Flats given to the Inhabitants

Implementation of social resettlement project will provide apartments to the inhabitants depending on preference of resettlement options. It is estimated that if one of the resettlement options (*Option III: Off-site Resettlement by PPP Investor, Option IV: Off-site Resettlement by PPP Investor with Real Estate, or Option V: On-site Resettlement by PPP Investor*) is chosen, each house owner will receive one flat. Therefore, the total no. of house owners (1,545) will receive **1,545** flats by selecting the above mentioned resettlement options.

12.14.2 Benefits to BHTPA

1. Royalty Received by BHTPA

Under Model C: Concession PPP Model (BOT), it is estimated that BHTPA will receive royalty from the PPP investor in the amount of **Tk 356 million** in the first 10 years and **Tk 3,583 million** over the 30 year term.

Under the Model D: PPP Concession Model with VGF, BHTPA will receive royalty from the PPP investor in the amount of of **Tk 356 million** in the first 10 years and **Tk. 13, 932 million** over the 30 year term.

Under the Model E: Leasehold Transfer Model, BHTPA will receive royalty in the amount of **Tk. 2,175 million** in the first 10 years.

2. Tax Levied by BHTPA

Financial analysis shows that Government will receive approximately Tk. 46 billion as taxes from the project over a period of 30 years.

3. Transfer of ICT Village to BHTPA

Under Option C, BHTPA will handle the development of land and off-site infrastructure. BHTPA will also be responsible for social rehabilitation of inhabitants of the Karail area and handing over clear land to PPP Investor for

development of Zone 1. It is estimated that at end of the concession period of **30** years, the PPP investor will return the land and facilities to the BHTPA at a depreciated value.

Under Option D, BHTPA will handle the development of land and off-site infrastructure and rehabilitation of inhabitants of the project site and the PPP Investor will establish a SPV with its own equity and/or loans from commercial lenders. The PPP Investor will generate revenue by leasing out space to tenants and will make royalty payments to BHTPA for the right to use the land. At the end of the concession period of **50 years**, the investor will return the land and facilities to the BHTPA at a depreciated value.

4. Economic Benefits of Social Resettlement Project to BHTPA

Implementation of Social Resettlement Project Under option V: On-site Resettlement by PPP Investor, BHTPA will receive five thousand one hundred forty eight **(5,148)** flats worth residential asset value of **Tk. 9,502 million**. Additionally, BHTPA will also receive three hundred forty seven **(347**) shops worth commercial asset value of **Tk. 3,167 million.**

It is estimated that BHTPA will earn Tk. **185 million** per year from renting flats and Tk. **49.97 million** per year from commercial spaces. Therefore, implementing social resettlement project will generate annual income of Tk. **235 million** per year for BHTPA.

13

Environmental Analysis

13 ENVIRONMENTAL ANALYSIS

Information and Communication Technologies (ICTs) are playing an increasing role in our society. From the local to the global level, ICTs have permeated all areas that pertain to socio-economic development, and are enabling the development of new skills, competitiveness and growth, particularly in developing nations. Despite its immense economic contribution, ICT has some adverse environmental impacts through construction of buildings, the manufacturing, operation and disposal of devices and network equipment. However it also provides ways to mitigate these adverse effects and promotes efficient energy use, for example through smart energy saving buildings and well designed telephone activities.

Environment Conservation Act 1995 (ECA-95) is currently the main legislative document relating to Environmental protection in Bangladesh. Under this Act any industrial unit / project shall require clearance from the Department of Environment (DOE). A set of relevant rules to implement the ECA'95 has subsequently been promulgated in August 1997 (ECR-97).

The ECR 97 includes lists of projects requiring varying degrees of environmental investigation. All the proposed projects under Orange (B) and Red category generally require an Initial Environmental Examination (IEE) for environmental clearance. Although this type of project is not categorized under the legislative documents of DOE, the ICT Village in Mohakhali may be labelled as Orange B category due to the environmental hazards posed during project construction and operation period. Under the World Bank Operational Policies, the project is categorized as Category B. As such, the project requires an IEE for environmental clearance.

In this respect, potential environmental, social and cultural impacts of the proposed project need to be identified in IEE report where adverse effects and mitigation measures, as well as benefits would be addressed.

13.1 Objectives of Environmental Study

The overall objective of Environmental Study is to identify the major environmental impacts resulting from the implementation of the project and to recommend mitigation measures to avoid or reduce these adverse impacts and to enhance positive impacts.

The specific objectives include:

i. To assess the existing environmental conditions of the project site and its adjacent areas in order to establish a baseline framework against which potential environmental impacts due to implementation of the project can be compared.

ii. To identify and assess impacts resulting from the project during its development or construction phase.

iii. To identify and assess environmental impacts resulting from the project during its operational phase.

iv. To develop a well balanced environmental management plan with recommendations for mitigating adverse impacts and enhancing positive impacts and outlining environmental monitoring requirements both during construction and operational phase of the project.

v. To identify issues that may require further studies.

13.2 Environmental and Social Study Methodology

The study methodology comprised the following activities:

1. Desktop study;
2. Field investigations

13.2.1 Desktop Study

The desktop study involved:

a) Initial meetings with client, project architects and engineers to discuss the proposed project, including project activities and options under consideration;

b) Collection and review of baseline data, maps, reports and other relevant information on the existing environmental and social conditions of the project area;

c) Review of existing legislation, regulation and policies relevant to the proposed project;

d) Review of proposed project engineering designs and construction inputs, including anticipated technical processes.

13.2.2 Field Investigations

Field investigations involved:

a) Site walks within the project area and the neighbouring areas that may be affected by the project;

b) Taking photographs of significant aspects to assist in describing the baseline environmental conditions of the project area;

c) Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties mainly within the project influence zone;

d) Obtaining relevant documents from the authorities such as local government, and key authorities within the project influence zone.

The aim of the field investigations was to verify information and data collected during the desktop study and to collect any new information that may have been important in the assessment of impacts and design of mitigation measures.

On the basis of relevant collected data, identification of possible impacts has been conducted. This was followed by evaluation of likely impacts along with their origin and extensiveness.

A team of consultants from IIFC made a field investigation to the proposed site on 20 January 2014. The investigation team composition is given below:

1. Mr. Mahbub Alam, Consultant and ICT Expert, IIFC
2. Mr. Shariful Islam, Consultant, IIFC
3. Mr. Sabeth Munrat, Project Officer, IIFC
4. Mr. Hasanuzzaman, ICT Expert, IIFC

13.2.3 The Site

The proposed site for the development of the Mohakhali ICT Village is located in the Mohakhali area of the capital city of Dhaka.. The site is surrounded by the areas of Gulshan and Banani.

The site is 10.5 km from the Hazrat Shahjalal Airport and 10 km from the Kamalapur Railway Station. The land area of the proposed site is 47 acres, and houses a portion of the illegally built Karail slum. It is bordered by the following:

- North Side: Banani Road
- On South Side: BRAC Center
- On East Side: Gulshan-Banani Lake
- On West Side: T&T Satellite

Figure 13.1: Physical Environment of Project Site

13.3 Bio-Ecological and Geographic Location

Dhaka city is located under the Brahmaputra-Jamuna floodplain, on the eastern banks of the Buriganga River, and the lower reaches of the Ganges delta. It is a densely populated urban area with very few open spaces or agricultural lands. Development and construction work is constantly going on in the city, changing most of its natural habitats. The project site itself is occupied by the Karail slum. It is a huge community with illegally built structures including houses, shops, schools and other makeshift structures. The heavily polluted Gulshan-Banani Lake, as well as various urban structures such as buildings, roads, shops etc surrounds the site. Inhabitants of the site keep small domestic animals like goats, but overall there is no significant farming or agricultural activities.

13.4 Description of the Existing Background Environment

Existing background i.e., baseline condition of environment states the present status of different components of environment in absence of the project. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from construction and operational phases of any project can be compared. A second important function of establishing a baseline for parameters such as air and water quality is to ensure that any problems arising from existing sources are not erroneously attributed to the project under study. In the present study the different environmental components, examined for setting baseline conditions of the project area, are physico-chemical, biological and

socio-economical. In physico-chemical component, parameters included are land, water quality, air quality, climate, and noise.

13.4.1 Physical Environment

i. *Climate*[7]

The project area is under tropical monsoon climate with three prominent seasons – summer/pre-monsoon (March to May), rainy/monsoon season (June to October) and winter season (November to February). The rainy season is hot and humid, and characterized by heavy rainfall, tropical depression and cyclone. The winter is predominately cool and dry. The summer is hot and dry interrupted by occasional heavy rainfall. Typical parameters of the weather elements, as recorded for the period of last ten years of observations (2003-2012) at Bangladesh Metrological Department, are presented in the following paragraphs.

ii. Temperature

The seasonal changes in temperature are noticeable throughout the year, with the warmest months being from April to September and the coolest months being December, January and February.

In the year 2012, the maximum temperature was 37.3°C recorded in the month of March and the minimum temperature was 9.6°C recorded in the month of December. The year wise temperature range for last decade is shown in the following table.

Table 13.1: Annual Temperature Data

Year	Minimum Temperature		Maximum Temperature	
	Degree (°C)	Month	Degree (°C)	Month
2003	8.1	March	36.7	June
2004	10.4	February	38.1	May
2005	11.4	January	37	April
2006	10.4	January	38.5	March
2007	9.6	January	37.5	May
2008	10.5	January	36.9	April
2009	11.1	January	39.6	April
2010	9.6	January	37.9	April
2011	8.2	January	36.236	September

[7] Source: Bangladesh Metrological Department

Year	Minimum Temperature		Maximum Temperature	
	Degree (°C)	Month	Degree (°C)	Month
2012	10.5	January	37.3	March

The above table shows the minimum recorded temperature throughout the last decade was 7.7°C in the month January 2011, while the maximum temperature recorded 39.6°C in the month April 2009.

iii. Relative Humidity

As would be expected, relative humidity during the wet season is significantly higher than those occurring at other period of the year. The relative humidity, at Mohakhali during the period 2003-2012 is well depicted by the data in the following table.

Table 13.2: Relative Humidity in Mohakali (Dhaka)

	Monthly Mean Humidity (in Percentage)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	75	65	64	70	72	81	79	78	82	80	66	72	73
2004	73	60	62	72	67	81	81	78	85	74	69	70	72
2005	68	60	66	66	73	79	81	82	81	80	72	66	72
2006	69	65	53	67	72	81	80	77	80	76	68	69	71
2007	68	68	54	69	70	81	84	80	80	78	77	69	73
2008	69	61	67	64	70	80	83	81	81	77	69	79	73
2009	72	55	53	66	72	74	80	82	81	73	66	69	70
2010	71	56	59	67	71	79	77	78	79	74	68	66	70
2011	69	54	57	64	76	80	79	82	77	73	67	73	70
2012	66	52	57	69	70	77	79	78	79	71	68	77	70
Avg.	69	60	59	68	72	80	81	80	80	76	70	71	72

High air temperature is observed throughout the summer season; daily air temperature variations are insignificant; air humidity is high with abounding rains. The average relative humidity recorded during the last decade is 72%. In the year 2012, monthly mean humidity ranges from 52% to 79%.

iv. Rainfall

Dhaka is located in highly rainfall prone areas and the annual rainfall ranges from 1,300 mm to more than 2,500 mm with an average of 2,043 mm per annum. Almost 80% rainfall occurs in monsoon and a negligible amount in winter. During the last decade, the highest and the lowest annual rainfalls

recorded were 2,885 mm in the year 2007 and 1,329 mm in the year 2012 respectively. The monthly rainfall during the last decade is depicted in the following table.

Table 13.3: Monthly Total Rainfall in Dhaka (in mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	0	25	96	123	140	473	191	202	264	134	0	45	1,693
2004	0	0	9	167	162	476	295	191	839	208	0	0	2,347
2005	1	3	155	91	291	259	542	361	514	417	3	0	2,637
2006	0	0	0	181	185	326	331	167	663	61	5	0	1,919
2007	0	30	11	163	185	628	753	505	179	320	111	0	2,885
2008	23	56	45	91	205	577	563	319	279	227	0	0	2,385
2009	1	1	43	14	168	170	676	482	298	74	4	0	1,931
2010	0	48	22	37	177	308	167	340	169	174	0	81	1,523
2011	0	0	20	123	235	314	356	409	207	112	0	0	1,776
2012	10	1	37	269	137	175	226	282	81	38	68	5	1,329
Avg.	4	16	44	126	189	371	410	326	349	177	19	13	2,043

The rainfall follows the general climate pattern with the highest rainfall in the summer months (June to September) and minimum rainfall in the cooler and drier months (November to March).

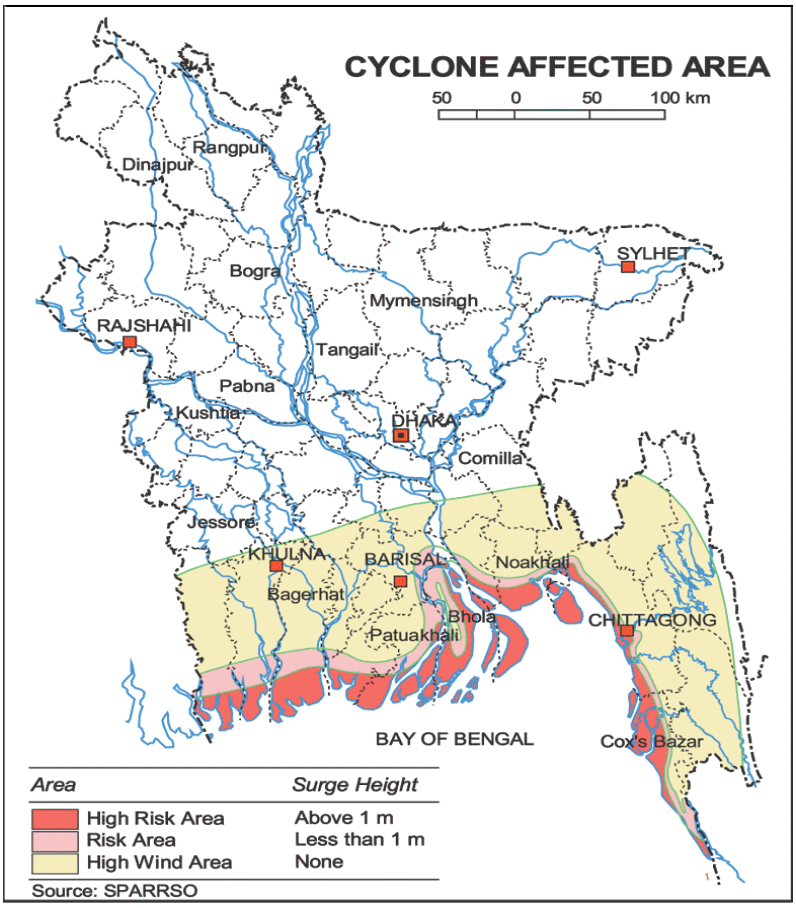
v. Topography

The construction site and its vicinity are relatively plain in nature.

vi. Cyclone

Bangladesh is subject to devastating cyclones, originating over the Bay of Bengal, in the periods of April to May and September to November. Often accompanied by surging waves, these storms can cause great damage and loss of life. The cyclone may create winds with speed of 100-150 miles per hour piling up the waters of Bay of Bengal to crests as high as 20 feet that crash with tremendous force onto the coastal areas and offshore islands. As depicted in the figure below, Dhaka is far away from the cyclone-affected area.

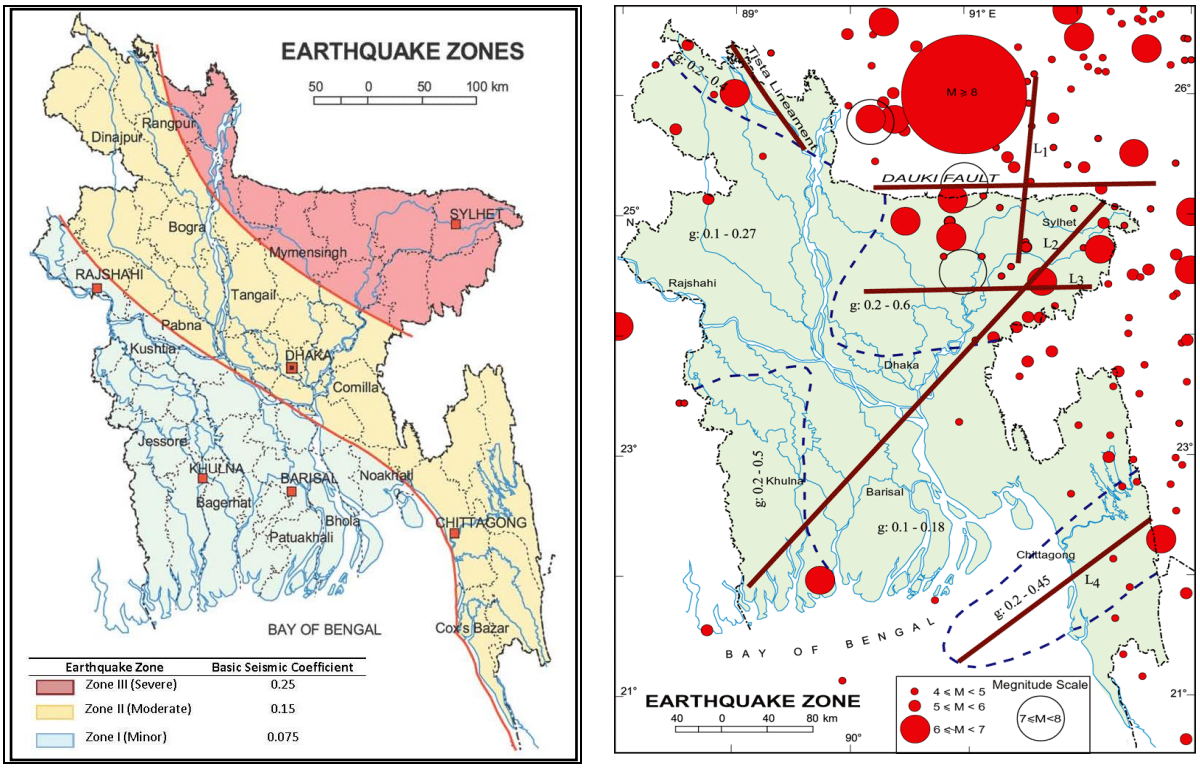
Figure 13.2: Cyclone Affected Area in Bangladesh



vii. Earthquake

Bangladesh is surrounded by the regions of high seismicity, which includes the Himalayan Arc and Shillong plateau in the north, the Burmese Arc, Arakan Yoma anticlinorium in the east and the complex Naga-Disang-Jaflong thrust zones in the northeast. It is also the site of the Dauki Fault system along with numerous subsurface active faults and a flexure zone called Hinge Zone. These weak regions are believed to provide the necessary zones for movements within the basin area. Earthquake zone and seismicity with magnitude of scale are depicted in the following figure.

Figure 13.3: Earthquake Zone of Bangladesh



Dhaka falls under Zone II with a moderate seismic coefficient and relatively far from significant seismic sources. As such, Dhaka and consequently the Mohakhali project site are not earthquake prone areas.

13.4.2 Biological Environment

A preliminary assessment of floral and faunal diversity was carried out around the project site. The main purpose of the ecological survey were (i) to explore the plant and wildlife species with their national and international status, (ii) to investigate the distribution and abundance of flora and fauna including fish species, and (iii) to make the preliminary assessment of the impacts for the proposed project activities on the ecological environment.

i. Flora and Fauna

Two types of ecosystem exist in the project site and adjacent area viz. terrestrial and aquatic ecosystem. The project site comparatively has low floral and faunal density. Urban terrestrial ecosystem plays an important role within the existing ecosystem. The project site has virtually no natural trees or vegetation, as it is located in a densely populated urban area. Herb and shrub are few in number and some grow naturally. Although the floral diversity and density are not enormous, it makes a simple ecosystem in which some wildlife has direct relationship through their ecological niche. Some wildlife uses these floral species as their permanent habitat, and others as

temporary habitat for a certain period. Some planted floral species (fruit and timber) have commercial and environmental value, and beneficiary groups are local people and some associate wildlife.

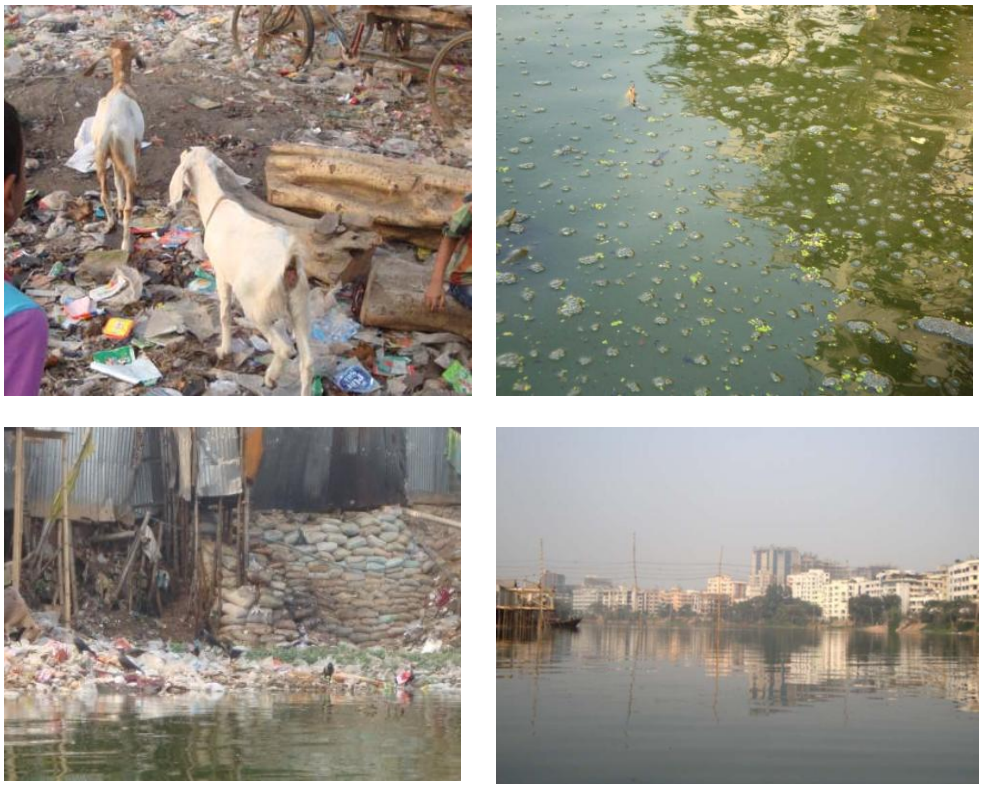
The project site has some wetland that have common aquatic flora found all over the country. A couple of aquatic floras (water hyacinth) have been identified here during survey.

The area supports a moderate number of wildlife. Brahminy Kites represent the ornithological class and were found flying in the sky during survey. Common toad and Common house lizard, observed at the site, are the representative of herpeto-faunal class. House crow, representing the Aves class, and Grey musk, representing the mammalian class, were observed. Many of the fauna depend on the associated terrestrial flora for shelter and food (insects).

A few amphibians (e.g., Skipper frog, Bull frog) and only one fish species (Spotted snakehead) were observed in the area. Aquatic environment of this section seems to have very low dissolved oxygen (DO) and thus unsuitable for most aquatic wildlife.

Figure 13.4: Terrestrial and Aquatic Flora around the Project Site

Figure 13.5: Terrestrial and Aquatic Fauna at the Project Site



13.5 Environmental Impacts at Different Phases

This section of the report presents the potential environmental impacts and mitigation associated with pre-construction, construction and operation of the ICT project and is based on 'superimposing' the project components onto the baseline compiled during the various studies.

All activities related to the lifecycle of the project will include appropriate mitigation measures to ensure that negative impacts are properly mitigated and managed. Mitigation involves identifying the best options to be adopted to minimize or eliminate negative impacts, highlighting the benefits associated with the proposed project and the protection of public and individual rights. Practical measures are therefore sought to reduce adverse impacts or enhance beneficial impacts of the project.

13.5.1 Pre construction Phase Impacts

This stage involves the design, planning and pre-construction activities of the project. Key activities to be considered include:

a) Vegetation clearing;

b) Transportation of materials to project site;

c) Public consultations;

d) Storm water management;

e) Visual intrusion;

f) Landscape design;

ii. Positive impacts during the pre construction phase

a) Public consultation

Prior to any development, a proponent is required to conduct public consultations and obtain feedback from the community on their views concerning the proposed project. Through this activity the proponent gets to know more on the views of the community about the proposed development and therefore incorporates appropriate measures in order to be in line with the needs of the community before implementation of the project.

b) Environmental Sound Design

The incorporation of mitigation measures during construction and operation period and recycling of solid and liquid waste into the design of the Mohakhali ICT Village ensure that environmental considerations have been taken into account in order to make it environmentally friendly.

iii. Adverse impact during the pre construction phase

a) Vegetation clearing

During site preparation, vegetation consisting of grasses, shrubs and trees will be cleared and the overburden removed so as to commence construction of the structures. Vegetation clearing is associated with loss of biodiversity, soil erosion, sedimentation and siltation, increased run off and degradation of surface water quality.

b) Risk due to earthquake

The project area falls in zone II, i.e. moderate seismic zone (Z= 0.15) as per the Bangladesh National Building Code (BNBC). Dhaka has not been hit by any severe earthquakes in recent times, however it does remain vulnerable and would suffer massive destruction if one were to occur. In light of this, necessary seismic factors suggested by BNBC should be incorporated suitably while constructing the structures to safeguard against earthquake risks.

13.5.2 Construction Phase Impacts

The project is designed to be very beneficial to the economy through providing support for digital Bangladesh. However, the potential positive and negative changes resulting from the project activities are predicted for the project area during the construction phase and into operations. An outline of the impact assessment procedure is as follows:

a) Identification of the baseline receptors;

b) Identification of the key project activities;

c) Impact evaluation; and significance ranking.

In a project of this magnitude and complexity there are some impacts which could affect soil, and water quality, and which could cause hindrance (noise, dust, traffic) or pose safety hazards (health and safety). The majority of these impacts is less significant and could be avoided, prevented or mitigated by contractors adopting good operational practices and environmental management guidelines and through permanent monitoring and inspection. Mostly all impacts could be prevented or mitigated by environmental management guidelines.

The components of the environment that may be affected by the proposed project during construction period are stated below-

i. Effects on Water, Air and Soil Quality

Generally, any project site is required to raise its level from the existing ground level by earth filling. Raising the land from its original level certainly disrupts the natural surface of the earth which will obstruct the natural drainage system of the area, if proper mitigation measures are not taken.

A landscape is a subjective concept that cannot be precisely quantified. However, in general, industrial buildings designed without consideration to the landscape, creates a sort of visual intrusion for the people. The proposed project changes the local landscape of the area to some extent by covering a green area into a built-up area. This will change the natural and visual equilibrium for the local people.

Any built up of the project should be designed considering the key criteria of landscape like coherence, readability, hierarchy, harmony and stability. It is understood that the project will have a modern architectural view which does not provide any significant visual intrusion.

Impact on soil is not expected to occur as the project does not use any toxic or any chemical for its process and operation.

ii. Effects on Flora and Fauna, Ecosystem and Habitats

The whole area is an urban mixed setting and does not represent any natural ecosystem of significance. The project area is encroached by slums, and does not have any significant agricultural land As such; there will be no loss and displacement of agricultural land and encroachment into precious ecological resources. Intervention of flora and fauna and habitats is expected to be negligible due to setting up the facility and its operation. The only major displacement is expected to be a social one.

iii. Effects of noise and emission

The effect of noise in the operation phase on ambient conditions is insignificant. The facility does not emit any green house gases.

13.5.3 Operational Phase Impacts

Though information technology i.e., computer use at all walks of life brings enormous benefit to the economy its adverse impact at operation level cannot be ignored. Its environmental impacts are often not realized or considered. These impacts are expressed throughout the manufacturing, use and disposal of computers, and thus require monitoring and an understanding of each stage of a computer's lifecycle. The impacts during operational phase can be briefed in the following paragraphs.

i. Social related impacts

During the construction period, temporary employment will be created. In recruitment of workers and technicians for the project priority will be given to individuals who live near to the project, including women. This includes the slum dwellers living on the project site, who will be provided with both employment and income. After finalization of construction there will be new permanent jobs created, most of them related to operation and maintenance (O & M) of the project. It is envisaged that about two thousand ICT professionals would be employed in the ICT Village. Besides, a large number of supporting staff involving in ICT business will contribute in the development of the economy.

The most significant positive impact of the proposed facility would bring economic benefits to the local people through employment in construction and operation phase of the facility.

ii. Effects of e-waste Disposal

E-waste is one of the most harmful by-products of ICT. Incorrect disposal and dumping of old equipments such as computer parts and other peripheral devices can be detrimental to the environment and cause serious health hazards. Technological advancements have shortened the life span of IT equipments leading to more frequent creation of e-waste, which only exacerbates the negative environmental implications. Studies have shown that incorrect disposal of old equipments can lead to highly toxic substances like Lead (Pb) and Cadmium (Cd) being released into the environment. These toxic chemicals can contaminate soil and groundwater creating and spreading further toxicity.

iii. Mitigation Measure on E-waste Disposal

The disposal of computers is a unique issue due to the fact that most computers are often disposed of before they truly become useless. In fact, the main reason for purchasing a new computer is not to replace a non-functioning system, but to keep up with rapidly changing technologies (Williams and Sasaki, 2003). One key term which is important for industry, the government, and the public, with respect to computer disposal, is "upstream management"; the various methods employed to reduce the

amount offing-coming computer wastes before they are disposed of for good (Williams and Sasaki, 2003). These methods embody the concept of Reduce, Reuse, Recycle, and have proven to yield many benefits, both environmental and socioeconomic.

Reducing the amount of computer waste relies heavily upon the reuse of systems that may be out of date, but fully functional. Reusing old computers can manifest itself in two main ways; by the selling or donation of old systems, or by up-grading existing systems (Williams and Sasaki, 2003). The key concept with respect to reuse is to meet the user's needs with existing machines, while extending that machine's lifespan.

13.6 Social Impact Analysis

At a broader system level, ICTs influence economic growth and bring about technological and societal change. Yet, while the increasingly widespread use of ICTs has changed people's lives dramatically and boosted economic growth, ICTs themselves, due to this success, are a growing contributor to greenhouse gas emissions. On the other hand, they probably provide the most significant opportunity to reduce greenhouse gas emissions in the major high emission industries of energy generation, waste disposal, building and transport.

13.6.1 Social Impact Assessment

The social impact of the facility is given below.

i. Increase Job Opportunities: The proposed ICT Village would increase the possibilities of suitable employment for the locals.

ii. Increase Land Value and Demand for Houses: The presence of the Mohakhali ICT Village will increase the value of land as there will be demand for land to construct additional houses to meet the needs of professionals and other staff who will work in the facility.

iii. Opportunities for Business: The Mohakhali ICT Village will generate extra business opportunities using faster communication technology. The increased business opportunities are expected to contribute to local as well as economic development of the country.

iv. Increased and Improved Infrastructure: The ICT Village would contribute towards provision of improved infrastructure facilities like supply of drinking water, roads and transportation. The improved roads and transport would not only help business and trade but also with access to education and health care facilities in addition to improving social relations and network.

v. Effects on Human Health, Occupational Health and Safety: The facility will be operated in a clean operation process that does not involve toxic

chemicals or hazardous substance. Human and occupational health concerns are expected to be minimal.

vi. Fire fighting provision will be maintained with adequate fire fighting equipment first aid medical facilities and proper ventilation.

Social issues and their mitigation measures are addressed in details in the volume-2 of this report titled as "Broad Resettlement Framework".

13.7 Outline of Environmental Management Plan

This section of the report presents an Environmental Management Plan (EMP) for the scheme which outlines the management mechanisms (i.e. working arrangements) for how the environmental and social elements of the project will be managed from detailed design, construction and operation.

The purpose of the EMP is to ensure that any potentially negative environmental impacts during construction and operation are kept at an acceptable level. It sets out to ensure that all aspects of the works comply with the relevant legislation, license conditions and good practice and those measures to mitigate impacts identified are implemented.

The EMP contains environmental requirements which are required for the successful implementation of mitigation measures, environmental monitoring, emergency measures and environmental auditing to be carried out during the construction works on the site. The implementation of mitigation measures and emergency measures shall be the responsibility of the project proponent. The proponent shall ensure compliance with all environmental legislation, regulations and conventions. The responsibility for environmental monitoring lies with the Implementing Agency.

The contractor of the investor will be contractually required to conform to the requirements specified in the EIA and EMP and will be accountable to the PPP Investor.

13.7.1 Principles of EMP and Detail Plan

The project should be implemented taking into account the need to minimize potential negative impacts and maximize its potential positive impacts on the biophysical and socio-economic environment as well as health and safety of workers and the public - this commitment must be made at various levels, from the senior management level of the project company, to the levels of all parts involved in the implementation. EMP includes monitoring activities:

Table 13.4: Environmental Management Plan

	Issues	Potential Impact	Mitigation Measures	Phase/s	Responsible Organization/ Person	
					Implementation	Monitoring
1.	Clearing the ground for construction site	Soil erosion, vegetation disruption	• Re-vegetation and soil compaction can be minimized the effects.	Construction	Contractors and Supervising Consultants	Project Implementation Unit (PIU)
2.	Surface and ground water pollution	Contamination surface water or ground water	• Wastes should be disposed of properly away from site; • Septic tanks and soak wells should be with proper design; • Pollutant materials such as fuels, lubricants, detergents, cement and others must be handled properly to avoid spills; • Minimizing disturbance of the groundwater level; • Washing of vehicles and equipment on the site shall be restricted; • the system for the sludge/slurry/ back wash water production should ensure minimization of leakages of it to groundwater.	Design and construction phase	Contractors and Supervising Consultants	PIU
3.	Air/Dust pollution	Health hazard to labours and residents	• Watering of dusty roads; • Sprinkling and covering stockpiles; • Water will be sprayed to suppress dust on an as required basis in construction phase.	Construction and operation phases	Contractors/ Supervising Consultants	PIU

	Issues	Potential Impact	Mitigation Measures	Phase/s	Responsible Organization/ Person
4.	Noise/ vibration pollution	Hearing hazards to labours and residents	• Scheduling of transportation not to disturb the community; • The vehicles and equipment should be inspected regularly to ensure its proper functioning and limit the release of fumes/noise; • The machineries should have silencing devises; • Ear muffs will be supplied for workers to wear, when working close to machinery to protect noise; • Vibrator insulator/ pad will be placed under electric pump/ motor as well as diesel generator to protect / minimize vibration and false wall within/ besides the main wall of motor/generator room will be constructed to protect noise; • Canopy built generator should be provided.	Construction and operation phases	Contractors/ Supervising Consultants PIU

	Issues	Potential Impact	Mitigation Measures	Phase/s	Responsible Organization/ Person	
5.	Waste/ sludge disposal Management	Contamination of biotic environment	• Wastes and debris should be disposed properly • Construction debris must be stockpiled and removed to a safe site. • Do not drop or expose any debris while transporting. • The retention/ settling basin, given its potential for environment contamination, should be designed so as to avoid any risk of either groundwater (through infiltration) or surface water and soil (through leaks, cracks, overload, etc.) contamination. • The retention/ settling basin be based on soil or rock, capable to support the maximum load of the basin; • The width of the limits of the basin must also be sufficient to support a rapid level rise that can happen in the retention/settling basin as a result of heavy rainfall. • Finally, the transference of retention/ settling sludge to the landfill of inert material should be made to avoid any contamination of soil or water.	Pre-construction, construction and operation phases	Contractors/ Supervising Consultants	PIU
6.	Soil erosion	Land slide/ battered slope, rain-cut etc.	• Ensure, layer to layer compaction, soil stabilization measures • Re-vegetate and restore disturbed soil • Shrubs/ herbs and Tree plantation may reduce soil erosion.	Construction and O&M phase	Contractors/ Supervising Consultants	PIU

	Issues	Potential Impact	Mitigation Measures	Phase/s	Responsible Organization/ Person
7.	Loss of soil fertility due to cut of top soil layer for construction	The top soil (6 inches) contains the elements of essential soil nutrients. If the cut of the top soil level occurs for construction	To avoid loss of soil fertility, due to cuts of top soil layer for construction, the surface soil should not remain at a lower level of the soil profile where it was but be on the top.	Construction phase	Contractors/ Supervising Consultants PIU
8.	Trees and vegetation	Deforestation and desertification	• Enhance environment by tree plantation in proper place of the project premises and by the approach road side; • Re-vegetation of barren surfaces be encouraged.	Construction phase and Operation phase	Contractors/ Supervising Consultants PIU
9.	Additional burden on utilities	Stress on water supply, energy, sewerage and communication	• Ensure adequate provisions for facilities with concerned organizations; • Proper O&M for sustenance of the structures and approach roads; • Harvesting rainwater to reduce pressure on drinking water supplier.	Construction phase and Operation phase	Contractors/ Supervising Consultants PIU
10.	Water supply and sanitation	Incidence of diseases	• Ensure adequate supply of drinking water to the labour; • Sanitation facilities for male and female workers separately; • All main pipes and connections to be used in subsurface must be inspected;	Construction phase and Operation phase	Contractors/ Supervising Consultants PIU

	Issues	Potential Impact	Mitigation Measures	Phase/s	Responsible Organization/ Person
11.	Health and safety	Health hazards and general safety of workers and people	• Arrange training for contractors and workers; • Workers involved with the operation should use personal protective equipment compatible with the work to be performed; • Make mandatory the use of personal protective equipment (uniforms, fluorescent vests, boots, gloves, ear protection plugs, protective glasses, etc.); • The water supply provided to the construction site must comply with the standards of potable water; • Ensure that adequate first aid equipment is available and that all workers are properly trained to use; • Permanent fencing will be established around the perimeter of the Facility; • Provision and inspections of fire fighting equipments and fire hydrant system in all sections.	Construction phase and Operation phase	Contractors/ Supervising Consultants PIU
12.	E-Waste	Health hazards	• Provision to reduce, reuse, and recycle of disposing equipment to maintain environmental and socioeconomic benefits.	Operation phase	Supervising Consultants PIU

13.8 Monitoring

Monitoring of the performance of the facility is very important and sometimes vital. An industrial unit in Bangladesh generally monitors the quality of its raw material and product, but not the related environmental parameters, thereby neglecting environment. It should be mentioned here that the monitoring program should be such that it can ensure compliance with national environmental standards and legal requirements. The importance of this monitoring program is also for ensuring that the plant does not create adverse environmental changes in the area and providing a database of operations and maintenance which can be utilized if unwarranted complaints are made.

For surveillance of the performance of the equipment and the quality of the environment, monitoring of the environment of the work-zone and the general environment should be performed on a regular basis. The key objectives of monitoring are to

i. ensure that the ESMP is implemented;
ii. evaluate the effectiveness of the mitigation measures;
iii. verify of predicted impacts;
iv. provide feedback to DOE/ licensing authorities.

Management can help reducing potential of any pollution or environmental concern, changes of accidents by putting trained operating personnel for effective operation and maintenance because it is the key for successful performance of any environment management system.

13.9 Way Forward

The analysis described above hinges on baseline data of affected area of the proposed project. It has identified the likely impacts of the project on environment and inhabitants. A preliminary environment management plan (EMP) including a monitoring program has also been outlined. Based on the analysis, an Initial Environmental Examination (IEE) report can be prepared to obtain Site Clearance Certificate (SCC) from DoE. The IEE report will include a terms of reference (ToR) for the Environmental Impact Assessment (EIA) and needs approval from DoE. After receiving the SCC, the project proponent needs to proceed for Environmental Clearance Certificate (ECC). For obtaining ECC, they have to prepare ESIA report and submit it along with the following documents.

- Feasibility Report
- Environmental Management Plan (including process flow diagram, layout plan, effluent treatment plant and its effectiveness)
- Emergency Plan relating to adverse environmental impact and plan for mitigation of the effects of pollution
- Detail Plan for addressing the DoE approved ToR

After approval of ESIA, construction of super-structure and erection of capital machinery can be done. ECC needs to be obtained before commercial operation starts.

14

Project Implementation

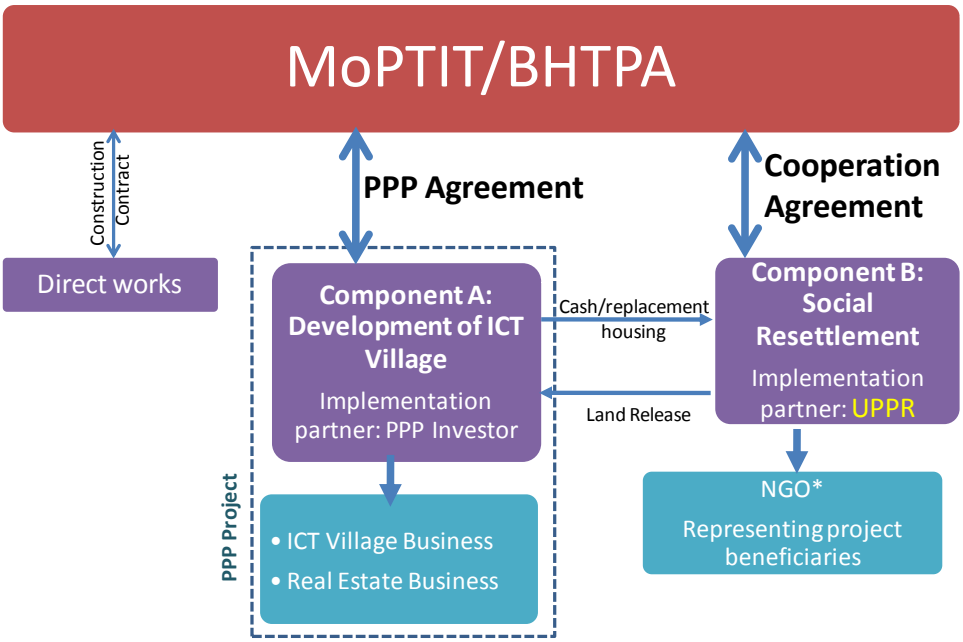
14 PROJECT IMPLEMENTATION

Project implementation encompasses all activities that need to be undertaken in transforming the project from plans to physical reality. The social resettlement issues involved with this project present a challenge to the implementation process. Keeping this in mind, this project has to be seen in two components:

- **Component A: Developing ICT Village**
- **Component B : Social Resettlement**

The following figure shows the broad institutional setup showing inter-relationships between the institutions in carrying out the overall project including social resettlement, with the above broad components:

Figure 14.1: Institutional Framework



*NDBUS or other suitable NGO

To implement these projects, different institutions / implementers need to follow highly integrated approach. The broad institutional setup shows the inter-relationship between the institutions in carrying out their respective roles for the entire project as discussed in the Broad Resettlement Framework.

The implementation involves the following phases[8]:

[8] PPP Policy Stratregy of Bangladesh defines the project development phases. The phasing sequence and numbering has been followed accordingly, for the sake of standardization and common reference.

Phase 1:	Project Identification[9]
Phase 2:	In Principle Approval[10]
Phase 3:	Feasibility Study[11]
Phase 3A[12]:	Preparation for Resettlement and Transaction
Phase 4:	RFQ
Phase 5:	RFP or Tendering
Phase 6:	Negotiation and Contract Award
Phase 7:	Financing
Phase 8:	Construction and Resettlement
Phase 9:	Operation and Maintenance

14.1.1 Phase 2: In-Principle Approval - completed

14.1.2 Phase 3: Feasibility Study – draft completed

14.1.3 Phase 3A: Preparation for Resettlement and Transaction

After the completion of the feasibility study (Phase 3), BHTPA will start preparation in two separate streams: resettlement and transaction *i.e.* decide on a suitable resettlement option from the options described in Section **Error! Reference source not found.**, and engage UPPR or an appropriate institution for the role of social resettlement implementation partner and engage transaction advisor. Under resettlement stream of action, UPPR will carry out the preliminary activities of resettlement until the PPP Investor is appointed. Under transaction stream, BHTPA will select a PPP Investor through a competitive bidding process, and enter into a PPP Agreement with them.

14.1.3.1 Engagement of Resettlement Partner

The BHTPA will engage UPPR/any other suitable agency for carrying out the resettlement process. The partnership will be formalized through the signing of a Cooperation Agreement between both parties. The resettlement partner will undertake the preliminary work at the project site. While engaging the resettlement partner, BHTPA will also establish of a resettlement unit, and grievance redress committee. They will also conduct surveys and consultation with the relevant stakeholders, and deal with all the necessary paperwork. The cheif responsibility of the resettlement partner will involve the disbursement of cash and/or other forms of compensation, depending on the resettlement option chosen by BHTPA. The roles and responsibilities of the resettlement partner should be clearly outlined in the Cooperation

[9] completed

[10] completed

[11] Draft completed

[12] Phase 3A has been added as an additional intermediate phase.

Agreement.

14.1.3.2 Consultation with PAPs and Engagement of Transaction Advisor

In this stage there shall be two stream of activities:

- Consultation: Consultation with project affected persons
- Transaction Advisory: Engagement of Transaction advisor

Consultation. After engagement of UPPR, UPPR shall start consultation with project affected persons and agree with them with respect to NDBUS to represent them. At this stage UPPR shall prepare Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and determine social entitlements based on discussion with project affected persons through NDBUS. The tasks to be performed by UPPR is provided in the Broad Resettlement Framework. At this stage, after completion of entitlement matrix BHTPA will approve the entitlements.

Transaction Advisory. In parallel with the above BHTPA may determine after completion of the feasibility work whether or not to proceed with the PPP transaction. If it is decided to move forward with the project, BHTPA will engage a transaction advisor who will be responsible to carry out the following activities:

i. Assist in preparation and distribution of notice for Expressions of Interest and evaluation of responses for short-listing purposes;
ii. Assist in preparation of bid package for developers, including draft PPP agreement appropriate to real estate development;
iii. Prepare risk matrix showing how draft PPP agreement will allocate project risks between BHTPA and the developer;
iv. Assist BHTPA staff in substantive matters (non-logistical) to prepare for and run bidders conference, integrate comments into bid package, and address follow-up questions;
v. Assist BHTPA staff in evaluation of bids using financial model developed in feasibility stage and selection of winning bidder;
vi. Assist in negotiation of PPP agreement and any update to risk matrix as may be necessary;
vii. Assist in developing monitoring procedures for completed PPP agreement;
viii. Assist in preparing documentation necessary to obtain PPP approvals; and advise at financial close.

14.1.4 Phase 3B: Relocate Project affected Households to Economy Housing

It is necessary to clear the land before any construction starts, given the project site is completely inhabited by the Project affected households (PAHs). However, it would be quite difficult to evacuate all the affected households at the same time. In view of this, the UPPR will take decision in consultation with the PPP Investor on which households to be evacuated for clearing a certain area of the project site. As such, the Investor will prioritize the zones and designate the area of land within the project site. At first, one or two blocks of economy houses need to be constructed to relocate a number of households and hence a certain area of land will be cleared. Then, UPPR will hand over the land to the Investor through BHTPA and the Investor will start construction of an ICT Village zone in that location. Thus, the construction of both economy housing and the ICT Village may run in parallel. This process of evacuation will continue until the entire land is released. It is suggested to set out a comprehensive evacuation plan in the RAP.

14.1.5 Phase 4-5-6: Transaction: Engagement of PPP Investor

BHTPA with the help of transaction advisor will carry out the following activities to engage the PPP Investor.

- Preparation and submission of Information Memorandum (IM) for the Project
- Publishing notification in newspapers for qualification document and arranging a conference for the interested investors
- Assessing qualification statements and notifying the qualified prospective investors
- Preparing tender document
- Publishing of tender notification in press and providing tender document to the prospective investors
- Arranging pre tender conference and providing clarification to the queries of the prospective investors
- Modifying tender documents (on agreed issues of the queries of investors)
- Forming a tender evaluation committee and evaluation of the tenders
- Issuing a Letter of Intent (LOI) to the successful investor, negotiating with the successful investor and receiving performance guarantee from PPP Investor
- Signing PPP agreement (Contract) with PPP Investor

14.1.6 Phase 7: Financing

After signing of the agreement, the PPP Investor will procure necessary finance through equity and loan for construction of the facilities.

14.1.7 Phase 8: Project Construction

This phase will begin after the financial closure by the investor and issuing request for the commencement of construction by BHTPA. In this phase, the project finance will be drawn down and the supply, EPC contractor and sub-contractors, engaged by the PPP Investor, will start construction, testing and commissioning of the different components of the project according to construction schedule, including the replacement housing and ICT Village.

However, the replacement housing shall need to be started first, so that before start of construction of the ICT Village, the project affected persons can be resettled to the replacement housing. During this period, UPPR will allocate the space in the replacement housing in consultation with NDBUS and project affected persons.

The major responsibility, related to the implementation tasks in this phase, will be borne by the PPP Investor. With the support of consultant, BHTPA will have to work intensively on Contract Management. However, a management team from BHTPA will need to be in place from the outset to ensure timely and satisfactory construction completion and successful operation of the project.

Project management team of BHTPA will oversee the tasks related to project construction and its commissioning. In this stage, the core responsibility of BHTPA will be to:

- take steps in resolving differences in the interpretation of tender conditions
- monitor the progress of project delivery and quality of work
- oversee the conduct of required tests, evaluate the test results and take decisions as required
- consider variations in the contract and take necessary steps
- inspect equipment to be installed
- provide certification and approvals as may be needed under the contract.

The construction phase will end with successful commissioning of the project. The start of construction will depend upon the PPP option chosen. The milestone of this stage will be the commercial operation date (COD), and the project will start delivering the contracted services. In the case of any permitted delay, this phase will be extended for a reasonable period.

14.1.8 Phase 9: Operation and Maintenance

Operation and Maintenance (O&M) phase will be effected from COD. In this

phase the PPP Investor will operate the business as per the contract. Overall business operation, strategic planning in complying with the contract and necessary maintenance of the buildings will be the core responsibilities of the PPP Investor. On a periodic basis, the PPP Investor will submit report on O&M activity to the BHTPA. For any material change from the contract, the PPP Investor will need the consent from the BHTPA.

The major tasks, at this stage from government/BHTPA's side, will include the following:

- Contract Management
- PPP Investor's O&M activity review
- Dispute Resolution as per the contract (if required)

This stage will continue up to the end of Concession Period. Intensive contract management by the government/BHTPA will be required at this stage. At the end of this stage, the PPP Investor will be disengaged. The method of disengagement will depend upon the model of private sector participation.

14.2 Environmental Clearances

The ICT village will have almost zero industrial waste except the standby power station. However, the software companies will have some old computers and accessories as e-waste, which has minimal effect on the environment. As per the Environment Conservation Rules, 1997 of Bangladesh, categorisation of industries does not explicitly include facilities generating e-waste. The project involves construction of civil structures and buildings.

It will be the jurisdiction of DoE as to the categorisation of the ICT village. However, If the project needs to be financed from the private sector window or any private sector financing facility of multilateral donors like the IPFF[13], carrying out necessary EIA and SIA as per the standard Environmental and Social Management Framework (ESMF) needs to be carried out. The following steps are envisaged with respect to environmental clearances with respect to the new facility.

14.2.1 Obtaining Site Clearance Certificate

The new facility needs to obtain Site Clearance Certificate (SCC) first. For obtaining SCC the documents in the footnote[14] needs to be submitted to the

[13] Investment Promotion and Financing Facility executed by Bangladesh Bank and funded by the World Bank

[14] For obtaining SCC the following documents need to be submitted to DOE:

(a) Application Form

(b) Feasibility Report

DoE. Upon receiving Site Clearance Certificate the land development and infrastructure development may be taken up.

14.2.2 Obtaining Approval for Environmental Impact Assessment

The new facility need to have EIA report to be approved by the Department prepared on the basis of program outlined in IEE Report along with time schedule and ETP design.

As a linked project, the preliminary EIA has to be initiated by BHTPA, just after the Feasibility Study is completed. With the preliminary EIA prepared by BHTPA, the PPP Investor will prepare detail EIA based on detail design of the project and may apply for clearance of the EIA to the DoE. Upon receiving EIA clearance from the DoE, the construction of superstructures (i.e. building) may be taken up.

14.2.3 Obtaining Environmental Clearance Certificate

After obtaining approval for EIA, the PPP Investor will apply for Environmental Clearance Certificate (ECC). For obtaining ECC the documents in the footnote[15] needs to be submitted to the DoE. Upon receiving ECC, the

(c) Initial Environmental Examination (IEE) report including the terms of reference for the Environmental Impact Assessment of the unit or the project and its process flow diagram

(d) No objection certificate of the local authority.

(e) Emergency plan relating adverse environmental impact and plan for mitigation of the effect of pollution.

(f) Outline of relocation, rehabilitation plan (where applicable).

(g) Other necessary information (where applicable).

[15] For obtaining ECC the following documents need to be submitted by BHTPA to DOE:

(a) Application Form

(b) Feasibility Study

(c) Description of raw materials

(d) NoC of local authority

(e) Income tax certificate

(f) Location Map

(g) Layout plan

(h) Process flow diagram

(i) Mouza Map

(j) Ownership dalil or lease-holding contract

(k) Registration of Board of Investment

(l) Certificate from BoI,/Bank/financial institution indicating date of establishment of the facility

new facility may receive utility connection and start commercial operation.

14.2.4 Responsibility with respect to Environmental Clearances

The following table shows the responsibly of BHTPA regarding the Environmental Clearances:

	Tasks	Responsibility
(a)	Preparing IEE	BHTPA
(b)	No Objection from Local Authority (*i.e.* DCC)	BHTPA
(c)	Submitting application for SCC	BHTPA
(d)	Preparing Preliminary EIA	BHTPA
(e)	Preparing Detail EIA	PPP Investor
(f)	Submitting application for EIA Approval and receiving EIA Approval	PPP Investor
(g)	Submitting application for ECC and receive ECC	PPP Investor

14.3 Project Management Unit

Timely completion of the Component A and Component B project and its successful operation depends upon the identification of all the activities and the active progress of those by Project Management Unit in BHTPA. The project management activities would be carried out by the Bangladesh Hi-Tech Park Authority (BHTPA), supervising other implementing partners PPP investors associated with the ICT village project and the major social resettlement part would be the responsibility of UPPR to complete in time. A Project Management Unit (PMU) needs to be formed for carrying out the activities required to be done by BHTPA and for accelerating, coordinating and supervising the activities of two implementing partners and assisting in discharging their roles and responsibilities. PMU is envisaged to function for a period until completion of the development of ICT Village for component A and construction of housing facility for component B.

14.3.1 Formation of Project Management Unit (PMU)

The Project Management Unit will be set up under BHTPA, responsible for managing day-to-day activities of the both projects. The PMU, headed by a Project Director, will be responsible for overall planning, supervisory,

(m) License from Fire Service

(n) IEE report

(o) EMP report

execution, coordination, evaluation and reporting necessary for implementation of the project in accordance with the PPP agreement with PPP investors (Component A) and Cooperation Agreement with UPPR (Component B).

14.3.2 Roles and Responsibilities of PMU

The PPP Agreement and Cooperation agreement with BHTPA will have certain obligations for PPP investors and Social Resettlement Expert-UPPR, which have to be duly carried out to satisfy the provisions of the agreement. As PMU shall be the entity assigned for successful implementation of the project, roles and responsibilities of BHTPA under the two agreements needs to be carefully identified. According to the both agreement, the specific responsibilities of the PMU will be as follows:

1. take steps in resolving differences in the interpretation of tender conditions
2. monitor the progress of project delivery and quality of work
3. oversee the conduct of required tests, evaluate the test results and take decisions as required
4. consider variations in the contract and take necessary steps
5. inspect equipment to be installed
6. provide certification and approvals as may be needed under the two agreements
7. Monitor construction activities of PPP investors and social resettlement activities of UPPR
8. Receive and review a monthly report on construction work and social resettlement work progress
9. Overall coordination to ensure socially responsible resettlement by integrating the work plans and budgets of the two components of the project – Components A and B

14.3.3 Reporting Arrangements

The Deputy Project Director for both components will report to the Project Director, BHTPA and will be responsible for the implementation of activities defined as obligations in the PPP agreement and Cooperation Agreement for this project. Moreover, to synchronize and coordinate the project management activities, there may be weekly progress meeting between PD and DPD's for both components particularly on critical issues.

14.3.4 Administration and Office Management of PMU

It is important to recognize the importance of office management as it organizes and manages resources in such a way that a project is implemented within a defined scope, ensuring quality, time and cost constraints are met.

One of the core tasks associated with office administration is the management of the employees associated with the office. Divisional heads of PMU will be responsible for supervising the office staff, making sure that each employee has resources necessary to competently carry out his or her assigned duties. Moreover, it also needs to provide support and assistance to employees when unusual situations arise during the completion of an assigned task. Conducting periodic employee evaluations, recommending pay increases, or providing employees with training facility, as a means of assisting those employees to improve their relationships with the employer will be under supervision of project director and divisional heads.

Along with managing and supporting employees, office administration also has to ensure that the office always has the resources needed to remain productive. As a whole, PMU will strive to keep the office operating within its assigned budget at all times, and provide some input into the budget planning for upcoming accounting periods.

14.3.5 Project Steering Committee

According to the Development Project Proposal (DPP), the TOR of the Project Steering Committee is as follows:

1. Approve project work-plan and other related issues, review suggestions placed by PIC, provide guidance/ instructions and overall assistance for implementation of the project
2. Review and monitor project activities and progress and provide guidelines for solving problems or constraints
3. The committee can co-opt additional member(s) if necessary
4. The PSC will meet after every 6 months or as and when necessary.

Table 14.1: Project Steering Committee

	Designation	Position in the Committee
1.	Secretary, Information and Communication Technology Division, MoPTIT	Convener
2.	Additional Secretary, Information and Communication Technology Division, MoPTIT	Member
3.	Deputy Chief, MOICT	Member
4.	Managing Director, Bangladesh Hi-Tech Park Authority (BHTPA)	Member
5.	Joint Secretary (Development), Information and Communication Technology Division, MoPTIT	Member

6.	Joint Chief (PAMSTECH wing), Planning Commission	Member
7.	Representative of IMED	Member
8.	Representative of Department Architect	Member
9.	Director Admin & Finance, BHTPA	Member
10.	Director (Technical), BHTPA	Member
11.	Officer in Charge, respective section, Information and Communication Technology Division, MoPTIT	Member
12.	Project Director- Establishment of Mohakhali IT Village in Dhaka	Member-Secretary

Source: DPP for Establishment of Mohakhali IT Village in Dhaka, July 2014

14.3.6 Project Implementation Committee

According to the Development Project Proposal (DPP), the TOR of the Project Implementation Committee is as follows:

1. Suggest implementation, review and monitor progress of the project
2. Identify existing problems and suggest resolving those
3. Physically inspect the operation and implementation of the project for collecting information for preparing the evaluation report
4. Prepare Project Evaluation report at the end of each year
5. The PIC will hold meeting at least once in two months or as and when necessary
6. The committee can co-opt additional member(s) if necessary

Table 14.2 : Project Implementation Committee

	Designation	Position in the committee
1.	Managing Director, Bangladesh Hi-Tech Park Authority (BHTPA)	Convener
2.	Representative of IMED	Member
3.	Representative of Planning Commission	Member
4.	Deputy Chief, Information and Communication Technology Division, MoPTIT	Member
5.	Director (Technical), BHTPA	Member
6.	Representative of Department Architect	Member
7.	Assistant Chief, Respective Section, Information	Member

	Designation	Position in the committee
	and Communication Technology Division, MoPTIT	
8.	Deputy Project Director- Establishment of Mohakhali IT Village in Dhaka	Member
9.	Project Director- Establishment of Mohakhali IT Village in Dhaka	Member-Secretary

Source: DPP for Establishment of Mohakhali IT Village in Dhaka, July 2014

14.3.7 Organizational Structure of PMU

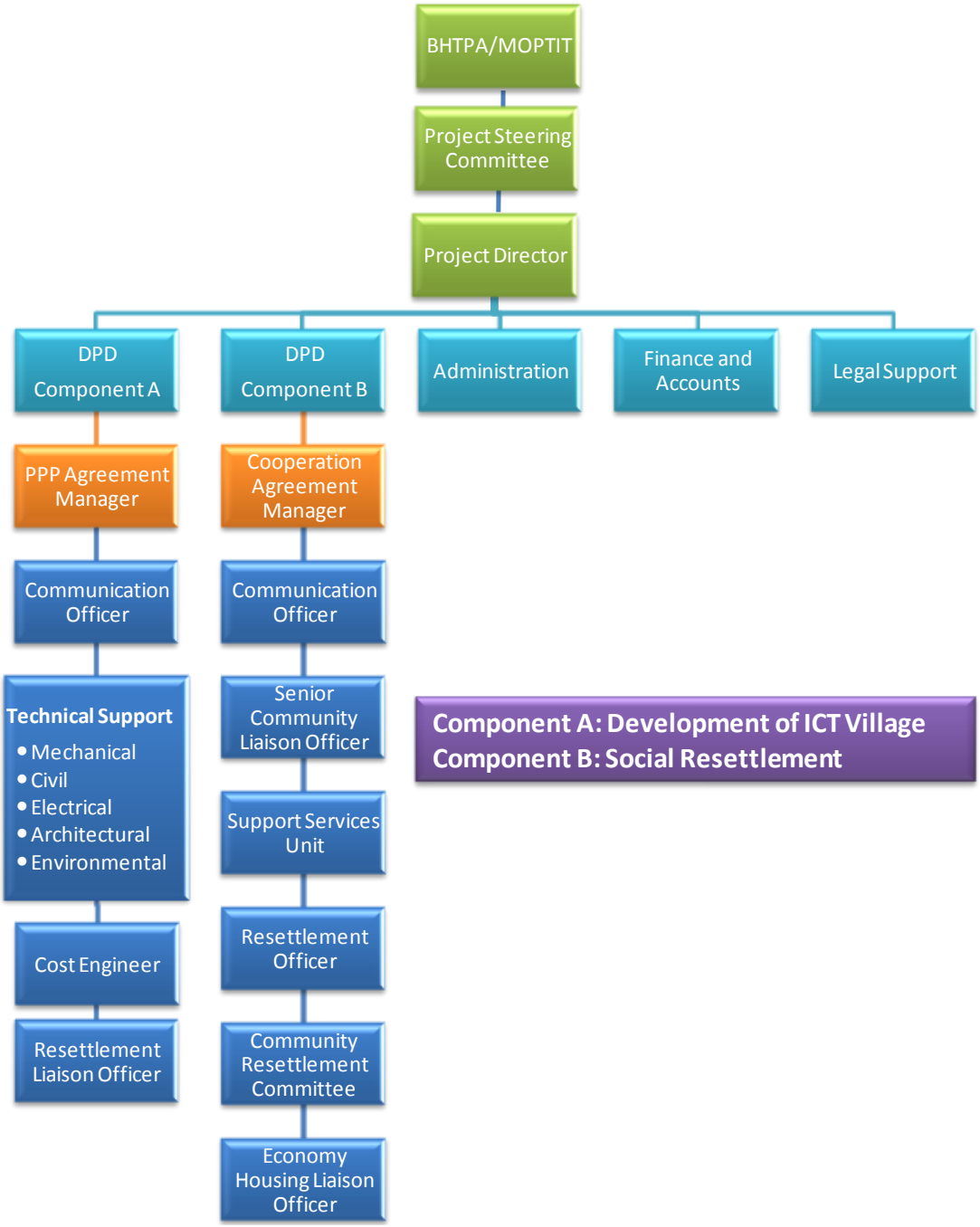
A strong project management unit well equipped with legal, technical and commercial aspects needs to be formed for successful implementation of the project. The project management unit will be headed by Project Director. Under the PD, there will be one Deputy Project Director (DPD) responsible for Component A and one Deputy Project Director (DPD) for Component B project. In component A, they will have PPP Agreement Manager and in component B, they will have Cooperation Agreement Manager to provide the progress report to their DPD respectively.

The Project Director will be responsible for coordination of activities of two DPD's for both components, which is important for the successful implementation of the project.

The function of Freed up Land which is the objective of Component B project: Social Resettlement division is important for successful completion of the Component A project: Development of ICT Village in time.

The organization structure of each of two components is separately shown in Figure 1.

Figure 14.2 Organogram of Project Management Unit



15

Conclusions and Recommendations

15 CONCLUSIONS AND RECOMMENDATIONS

The results of the feasibility study indicate that development of ICT Village at Mohakhali through PPP will be financially viable when some major steps are taken to structure the project. The proposed steps are discussed below:

15.1 PPP Option

The financial model has been prepared based on **Model C: Concession PPP Model (BOT)** as the base case. Under this model, the PPP Investor will be responsible for construction of MTB. After construction completion, PPP Investor will lease out office space in the MTB. In return for the right to use BHTPA's land, the PPP Investor will pay Royalty to BHTPA. Royalty payment will be in two forms:

- Upfront payment of Tk. 5 million at signing of PPP Contract
- Yearly payment of 2% of Gross Revenue

PPP Investor will also be responsible for operation and maintenance of the ICT village including the MTB throughout its PPP Contract Term. After end of Term, the O&M of the ICT Village will be handed back to BHTPA.

Financial analysis of the base case option demonstrates that the project will be financially viable under this model.

Financial analysis of Model E has been conducted as an alternate PPP options. In this model, PPP Investor will not operate the ICT village for 30 years but for only 10 years. However, they will be allowed to transfer the lease holdings of the built-up space for long-term leases (60 years) to building tenants. In this model, PPP Investor will pay royalty to BHTPA in the amount of:

- **Upfront payment of Tk. 500 million at signing of PPP Contract**
- **Yearly payment of 5% of Gross Revenue**

Financial analysis of this option demonstrates that the project will be financially viable under this model. Higher rates of return in Model E compared to Model C as well as shorter payback periods indicate that Model E will be more attractive to PPP Investors. BHTPA will also earn significantly higher royalty in Model E, compared to Model C.

15.2 Contracting Strategy for Zones

- The project is proposed to be divided into six different zones based on functions and businesses. BHTPA has the flexibility to bid out either seperately for each of the zones or combindely for all the zones. Given the nature of business is different from each other, it would be difficult for an investor to execute the development ICT Village under a single contract.

- Although BHTPA has already issued a Request for Qualification (RFQ) notice on 7 November 2013 for engaging a single developer, the idea of Single developer is not worthwhile from the management and monitoring point of view.

15.3 Environmental Impact

- No major irreversible impacts are expected from the project. Being largely focused on the service sector, levels on environmental are low compared to other infrastructure projects.
- Adequate measures should be undertaken during construction phase of the project in order to mitigate environmental hazards like air and noise pollution, traffic congestion etc.
- It is highly recommended to follow appropriate mechanism for disposing e-waste, as huge quantity of e-waste expected to be produced during the operation phase of the project.

15.4 Social Impact and Resettlement

- Implementation of the project will mean involuntary displacement of huge number of inhabitants living in the project site and pose adverse impact to every aspect of their life.
- Government should play a decisive role while selecting a replacement/resettlement site option as all the subsequent activities for the implementation of the project will hinge upon the option chosen.
- Inter ministerial involvement is required to reach a consensus over the resettlement issues if the whole Korail slum is considered
- After taking the decision on a resettlement option, BHTPA should engage UPPR as social resettlement implementation partner under a cooperation agreement

15.5 Site Improvement and Civil Constructions

- The land at site is relatively high and does not need much land-filling. Also, all along the lake shore, bank protection and shore demarcation is to be done by suitable shore–piling, by timber bullah or steel sheets. Some quantity of earth filling along the shore will be required to bring the entire land to one level.
- During construction of the MTB and other buildings, best standard practice is to be maintained and the Bangladesh National Building Construction Codes must be followed.

15.6 Next Steps

For successful project implementation, it is important to have a Project Management Unit in place in BHTPA. The unit needs to be assigned with the

responsibility of project implementation including all the critical issues regarding this project. The management structure should involve a project team headed by a Project Director/Manager. The composition of the team may be changed time to time to meet the specific expertise needed during any phase of the project.

The appropriate model of inviting PPP Investor and the PPP Investor's scope of work that is suitable for the investors needs to be decided by BHTPA. A list of potential investors needs to be prepared, and the concept needs to be conveyed and consulted through a consultation paper in the Investor Promotion Meeting. In addition, steps need to be taken to start preparation of the Tender documents for procurement of a suitable PPP Investor for implementation of the project.

After submission of this feasibility report, following steps need to be taken:

1) *Form the Project Management Unit – MoPTIT/BHTPA*
2) *EngageSocial Resettlement Partner, UPPR – BHTPA*
3) *Prepare EIA – BHTPA*
4) *Prepare full RAP – UPPR*
5) *Consult PAPs Agree with PAPs – UPPR*
6) *Arrange and receive SCC – BHTPA*
7) *Engage Transaction Advisor – BHTPA*
8) *Approval of Major Terms and Conditions – BHTPA*
9) *Government decision on PPP Option and Model – MoPTIT/BHTPA*
10) *Prepare RFQ document – Consultant/ BHTPA*
11) *Identification of potential investors – Consultant/ BHTPA*
12) *Prepare RFP document – MoPTIT /BHTPA*
13) *Tendering and Evaluation – Consultant/ BHTPA*
14) *Negotiation and Contract Award – MoPTIT /BHTPA*