Feasibility Study Jessore Software Technology Park

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### ACRONYMS AND ABBREVIATIONS

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<tbody>
<tr>
<td>MOICT</td>
<td>Ministry of Information and Communication Technology</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>BCC</td>
<td>Bangladesh Computer Council</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>BHTPA</td>
<td>Bangladesh Hi-Tech Park Authority</td>
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<tr>
<td>BANBEIS</td>
<td>Bangladesh Bureau of Information and Statistics</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<td>ITES</td>
<td>Information and Technology Enabled Services</td>
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<td>SICT</td>
<td>Support to ICT Task Force</td>
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<td>MDG</td>
<td>Millennium Development Goals</td>
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<td>PRSP</td>
<td>Poverty Reduction Strategy Papers</td>
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<td>PSTN</td>
<td>Public Switched Telephone Network</td>
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<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
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<tr>
<td>VSATS</td>
<td>Very Small Aperture Terminal</td>
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<td>BTRC</td>
<td>Bangladesh Telecommunication Regulatory Commission</td>
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<td>SASEC</td>
<td>South Asian Sub Regional Economic Cooperation</td>
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<td>Asian Development Bank</td>
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<td>BOT</td>
<td>Build-Operate-Transfer</td>
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<td>CCCI</td>
<td>Chittagong Chamber of Commerce &amp; Industry</td>
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<td>UIC</td>
<td>Union Information Center</td>
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<td>Multi Tenant Building</td>
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<td>Union Information Service Center</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>Infrastructure Investment Facilitation Company</td>
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<td>BASIS</td>
<td>Bangladesh Association of Software and information Services</td>
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<td>BPO</td>
<td>Business Process Outsourcing</td>
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# Acronyms and Abbreviations

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<td>IPR</td>
<td>Intellectual Property Rights</td>
</tr>
<tr>
<td>CMMI</td>
<td>Capability Maturity Model Integration</td>
</tr>
<tr>
<td>MFI</td>
<td>Micro Finance Institutions</td>
</tr>
<tr>
<td>RGM</td>
<td>Ready-Made Garments</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>ADP</td>
<td>Annual Development Programme</td>
</tr>
<tr>
<td>CIT</td>
<td>Computer and Information Technology</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>IPS</td>
<td>Inter Process Service</td>
</tr>
<tr>
<td>3G</td>
<td>Third Generation</td>
</tr>
<tr>
<td>BTCL</td>
<td>Bangladesh Telecommunication Company Ltd</td>
</tr>
<tr>
<td>BSCCL</td>
<td>Bangladesh Submarine Cable Company</td>
</tr>
<tr>
<td>TSS</td>
<td>Telephone Shilpo Sangtha</td>
</tr>
<tr>
<td>ECNEC</td>
<td>Executive Committee of The National Economic Council</td>
</tr>
<tr>
<td>BCS</td>
<td>Bangladesh Computer Samity</td>
</tr>
<tr>
<td>DPP</td>
<td>Development Project Proposal</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
</tr>
<tr>
<td>IDA</td>
<td>International Development Association</td>
</tr>
<tr>
<td>SPV</td>
<td>Special Purpose Vehicle</td>
</tr>
<tr>
<td>VGF</td>
<td>Viability Gap Fund</td>
</tr>
</tbody>
</table>
Executive Summary

The honourable Prime Minister, during her visit at Jessore (a district under Khulna Division) on 27 December 2010, promised to establish an IT park there as part of the Government’s ‘Digital Bangladesh’ concept. Following her commitment, the project titled ‘Establishment of Jessore Software Technology Park’ has been taken up by the Bangladesh Hi-Tech Park Authority (BHTPA). The project got the approval of ECNEC on 05 March 2013.

The objective of the ICT Village project is to establish knowledge based industries throughout the country, particularly related to Software and IT Enabled Services. This will contribute to the national economy and help achieve the goals of Vision 2021: Digital Bangladesh. The Government of Bangladesh intends to create basic infrastructure for establishing an ICT Village in 3.03 acres land allocated at Barandi Mouza, Jessore. This land will be used to develop a world-class business environment, conducive for the IT/ITES industry.

BHTPA, in its Executive Committee meeting held on 26 April 2012, took a decision of establishing ICT villages at divisional levels of Bangladesh. In this regard, BHTPA intended to conduct feasibility studies for ICT Village at Mohakhali, Dhaka and at six sites at Jessore, 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 an ICT Village at Jessore as the first part of its assignment.

Bangladesh ICT Industry

The IT/ITES industry is one of the fastest growing industries in the world. Through its rapid growth, it is playing an increasingly prominent role in Bangladesh’s economy. This industry serves both domestic and international markets. There are over 800 registered software and ITES companies in Bangladesh, and 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 on 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 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.

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 center 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 such as Ministry of ICT, Ministry of Post and Telecommunication, 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. There are eight Regulatory Authorities involved in enabling the development of ICT businesses; Ministry of ICT, Bangladesh Computer Council, Bangladesh Hi-Tech Park Authority, Ministry of Post and Telecommunication, Ministry of Commerce, Ministry of Information, Bangladesh Bank, and the Bangladesh Telecommunication Regulatory Commission. For enabling the development of ICT sector, Government of Bangladesh provides 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.

**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. 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 internet services provided by different category are shown below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Subscribers (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Internet</td>
<td>35.12</td>
</tr>
<tr>
<td>ISP and PSTN</td>
<td>1.23</td>
</tr>
<tr>
<td>WIMAX</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36.67</strong></td>
</tr>
</tbody>
</table>

*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**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Subscribers (in crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>3.4</td>
</tr>
<tr>
<td>2008</td>
<td>4.5</td>
</tr>
<tr>
<td>2009</td>
<td>5.2</td>
</tr>
<tr>
<td>2010</td>
<td>6.9</td>
</tr>
<tr>
<td>2011</td>
<td>7.3</td>
</tr>
<tr>
<td>2012</td>
<td>8.7</td>
</tr>
<tr>
<td>2013</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Teledensity (%)  
| 2007 | 24.7 |
| 2008 | 27.9 |
| 2009 | 32.0 |
| 2010 | 38.1 |
| 2011 | 44.6 |
| 2012 | 60.9 |
| 2013 | 64.6 |

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 fiber based transmission backbone facilitating a common connectivity platform. All the three 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.

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.

The country 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.

### Cross-border Connectivity with Indian Operators

<table>
<thead>
<tr>
<th>India</th>
<th>Connecting Path</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State-owned Telcos</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>Kolkata – Geddes- Darshana BTCL</td>
<td></td>
</tr>
<tr>
<td><strong>Private ITC Operators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bharti Airtel</td>
<td>Kolkata – Bongaon – Petrapole – Benapole</td>
<td>Fibre@Home Limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summit Communications Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mango Teleservices Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Novocom Limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BD Link Communication Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1Asia Communication (BD) Ltd</td>
</tr>
</tbody>
</table>

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). The process connecting the Bangladesh with second submarine cable will be completed by 2014.

### Demography: Jessore District

Jessore district falls within the Khulna division. The district of Jessore is bordered by Jhenaidah and Magura districts on the north; Satkhira and Khulna districts on the south; Narail and Khulna districts on the east; and West Bengal of India on the west. The distance, by road, between Dhaka and Jessore is approximately 393 km. Transportation by railway is also available. In addition to road and railway, air transportation is also available.

Of the total number of households in Jessore, 65.8% use electricity as a source of light. Moreover, there are approximately 27,770 persons of which 86.3% are male and 13% are female, with access to internet in Jessore (BBS, 2011). There are about 15 lakh persons out of which 52.4% are male and 47.6% are female, who watch television regularly. There are also 23 separate banks with multiple branches in Jessore, making access to credit at competitive rates easily available.

The district of Jessore consists of Abhaynagar, Bagherpara, Chaugachha, Jhikargacha, Keshabpur, Jessore Sadar, Manirampur, and Sharsha. The total area of Jessore District is about 2,578.20 sq km, and its population as per the
Feasibility Study for Jessore Software Technology Park

census of 2011 is 27 lakhs. A High literacy rate of 79.4% exists between the 15-29 age group of the population. The main occupations in Jessore are related to agriculture. Jessore has one Science and Technology University, one Medical College, one polytechnic Institute, one Computer management college, 45 Degree Colleges, 33 intermediate colleges and 13 School cum Colleges. Compulsory computer courses are included in most of the institutes throughout the country. The number of yearly IT Graduates from Jessore and its surrounding universities is 660. Additionally, 4,917 IT professionals graduate with Diplomas from Polytechnic institutes in Jessore and its surrounding areas. Added together, this gives a total of 5,577 IT skilled professionals. This means that a sizable young population is ready to take up work in the IT sector, with the proper training and guidance. These groups of population can be very much useful for the IT/ITES industry, provided they are well trained for the business.

The Project Site

The Jessore ICT village is expected to be built on 3.03 acres of land located in Barandi and Shonkorpur Mouza of the Sadar Upazilla of Jessore District. The site of the proposed ICT village is located at 23°09’ 21” N to 89°13’20” E and about 2 km from the Jessore city center. It is approximately 8 km away from Jessore Airport and about 3 km from the railway station. The site is accessible by road, from the north and west sides. To the west are the Jessore Regional Passport Office and Technical Training Centre. There is a public library in the north-west corner. In the south-west corner is a six-storied apartment building of Department of Social Services (DSS).

The site is a non-arable flat land with a shallow ditch in the middle. It is almost vacant and no structures or settlements have been identified on the site except two semi-pacca houses which are being used as residential purpose by the fourth class employees of PWD. The land was previously owned by Public Works Department (PWD) for developing a brick field. The Ministry of Land gave their concurrence to handover these three acres of land from Barandi Mouza and Shankarpur Mouza to the Ministry of Information and Communication Technology (MoICT) by transferring ownership from the Public Works Department (PWD). The Project Site is situated at about half kilometer from the Jessore-Khulna Highway and linked with an access road which is locally known as Nazirshankarpur Road.

The nearest sub-station (33/11 kV) for power supply is situated within 1km from the project site at Bajpara. The second nearest sub-station is located at Chanchra, which is 2.5 km from the site. Both the stations with capacity of 2X10 MVA are owned and maintained by West Zone Power Distribution Company Limited (WZPDCL), an enterprise of Bangladesh Power Development Board (BPDB). However, for ensuring dependable and reliable power supply and maintaining redundancy, the ICT Village may be connected
with both the sub-stations through express feeder line. To ensure continuous power supply, a sub-station with a capacity of 1,000 kVA needs to be set up inside the Village.

It has been found that three NTTN operators (BTCL, Fiber @ Home and Summit Communications) 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.

The proposed ICT village at Jessore will be very much suitable for the Kolkata based ICT companies in outsourcing their businesses to Jessore in order to cater their local demand. Factors like Cheap labour Cost, Location of the Site, Cultural/ethnic similarity – language, High capacity optical Fiber link between India and Bangladesh through Petrapole-Benapole boarder etc. will attract the companies in outsourcing their business to Jessore ICT village.

Market Survey

To explore the market demand and industry trends of ICT industries for the development of ICT Villages at Jessore, IIFC surveyed the ICT companies in the area. The IIFC team also surveyed the ICT companies at Dhaka to assess their willingness to relocate / expand their business to the proposed ICT Villages at Jessore. An online survey was also conducted amongst ICT freelancers in the country to assess their willingness to work on the proposed ICT village.

The sample size for survey of ICT companies at Jessore is considered as 18, which is almost 100% of total population. BASIS has 800 member companies based in Dhaka. IIFC has considered these listed companies as the total population for survey of ICT companies in Dhaka. The sample size is considered as 50, which is 6% of total population. For its survey, IIFC chose companies that have a mixture of the following four types of business.

1. Software Development and Services,
2. Business Process Outsourcing,
3. Training and
4. Others.

The ICT industry in Jessore is only beginning to grow. There are a few software companies in Jessore; most ICT companies in the area supply computers or operate cyber cafes. The survey result shows that most of the companies in Jessore fall within the income range of USD 0-150,000 (up to Tk. 1.2 cr). The office space rental is quite reasonable and cheap. Electricity and fuel cost are also not very high. This is because the major proportion of the
ICT Industry in Jessore is made up of very small companies. Average bandwidth cost is also very low. As most of the companies conduct hardware based business, their bandwidth requirement is not very high.

Survey result shows that 100% of the companies at Jessore have shown their interest to relocate or expand their business to the proposed ICT village. During the survey of ICT companies in Dhaka, it was also noticed that 22% (7 out of 32) companies are willing to outsource/ sub-contract work-orders to the proposed ICT village at Jessore. During the survey of ICT companies in Dhaka, it was also noticed that 20% (7 out of 35) companies have shown their interest to expand their business from Dhaka to Jessore ICT village. Most of the respondents prefer to have an office space of 1,000 sft to 1,500 sft for business. According to the survey, reliable power supply is the highest priority need for ICT companies in Jessore. Cheap rent/ cost of land, secured business environment, strong customer base are the other important factors.

The survey results show that from the perspective of Dhaka based ICT companies; reliable power supply is the most important factor. The next items include fiscal incentives, cheap rent/ cost of land, reliable internet connectivity, and secured business environment.

From the perspective of Jessore based ICT companies availability of conference hall is the most important factor among the ancillary services. Having 24/7 technical support and R&D Center are the next priorities. From the perspective of Dhaka based ICT companies R&D Center stands out as the most important facility with availability of training center following next.

During the survey of freelancers, it was observed that only 5% (1 out of 22) respondents have shown their interest to work on the Jessore ICT village. Reliable internet connectivity is the most priority need of freelancers according to survey findings. Availability of training center is the most important factor among the ancillary services. Having 24/7 technical support, conference hall, and R&D Center are the next priorities.

**Demand Forecast**

With inputs from market survey, the demand forecast of Jessore 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) 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
Feasibility Study for Jessore Software Technology Park

8

(Mbps/Tk. m) of Bangladesh ICT Industry for a period of thirty years are determined.

Therefore the volume for Jessore ICT Industry is considered as 1% of total Bangladesh ICT Industry. The volume for Jessore ICT Village is considered as 85% of total Jessore ICT Industry. Industry volume of Jessore 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 Jessore ICT Village is also generated.

The total lease able area of ICT Village is 64,200 sft. Based on the demand forecast in different scenarios, the occupancy rates in different scenarios will be assumed.

**Table 1: Demand Projection for Space in Different Scenarios**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Space Requirement (sft) of Jessore ICT Village</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y1</td>
</tr>
<tr>
<td>Base Case</td>
<td>33,277</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>36,928</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>30,469</td>
</tr>
</tbody>
</table>

The above table shows that, the demand for space of 64,200 sft will be filled up within 7 years in base case, 5 years in optimistic case and 10 years in conservative case.

The percentages of space requirement of different category of businesses in the ICT village are considered as follows:

<table>
<thead>
<tr>
<th>(a)Software Development</th>
<th>(b) BPO</th>
<th>(c) Training</th>
<th>(d) Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>75%</td>
<td>15%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

A maximum of 45 tenants can be accommodated in the ICT village. The number of units for each category of business and their standard space requirements are as follows:
Feasibility Study for Jessore Software Technology Park

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Suggested Number of units</th>
<th>Space Requirement (sft/tenant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Software Development and Services</td>
<td>31</td>
<td>1,500</td>
</tr>
<tr>
<td>2. BPO</td>
<td>6</td>
<td>1,500</td>
</tr>
<tr>
<td>3. Training</td>
<td>2</td>
<td>1,500</td>
</tr>
<tr>
<td>4. Other</td>
<td>6</td>
<td>500</td>
</tr>
<tr>
<td><strong>Total no of Units</strong></td>
<td><strong>45</strong></td>
<td></td>
</tr>
</tbody>
</table>

The rate of fill up of the ICT village will depend on the growth rates of the ICT industry. The ICT village is projected to create a large number of jobs. Approximately 950 jobs can be created which will significantly impact the economic development of the country.

**Technical Planning and Design**

There will be a Multi Tenant Building (MTB) in the Jessore ICT village, where a majority of the floor area is to be leased out to private sector software development companies and entrepreneurs. Other major facilities include Food court, and Seminar and Conference facilities buildings. Support services like, Substation, Generators etc. and a Dormitory Building to house the people working in the main buildings are also to be provided in ICT village.

The site itself is a depression with water collecting to the south side on the site itself. Thus it will need considerable filling and compaction to bring it up to the level of desired grade for construction. One other major drawback of the site is that it is at the end of a road. The other road that goes past on the west side becomes very narrow and is not fit for vehicular navigation without major expansion. The access road is therefore like a Cul de sac with no scope for traffic egress. This could pose a problem in the future for access of fire Fighting trucks and other emergency vehicles.

For the proposed ICT Village at Jessore two master plans were prepared by two different consulting firms. These are as follows:

1. **Master Plan Option A** (prepared by Urban Habitat Consultant)
2. **Master Plan Option B** (prepared by Bangladesh Consultant Ltd.)

Two different master planning options were explored with the given functional programs to accommodate:

1. A MTB (Multi Tenant Building, primarily for Software development) with Conference / seminar / sales and food Courts etc and an area of 110,000 sft building
2. Future Expansion of the Software development possibilities
3. Data Centre
4. A Dormitory / Hostel and a Gymnasium Building with about 120 -140 bedroom and related facilities etc
5. Ancillary Building with Substations, Generators, and miscellaneous storage space etc
6. Recreational spaces
7. Adequate parking ( as per code ) on site

The main buildings of Jessore ICT village will be structural steel structures. The columns and beams will be of prefabricated structural steels. This will aid in quick erection and implantation of the building. In fact the erection of the steel structure can be made in a matter of four to six months as opposed to fifteen to eighteen months for a RCC (Reinforced Cement Concrete) structures.

The soil conditions on the site are weak and the recommendations for building using piles suggest a 6 storied RCC structure or steel building up to 7 floors. Thus, building structures like 10+ storied building could be problematic and would require alternate types from pure pile foundation system. Thus this decision should be taken carefully by the project engineers, considering all soil and foundation issues.

**Capital Cost Estimates**

Total project construction costs under the two different master plans are shown below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Total Cost (Tk million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Option A</td>
<td>Option B</td>
<td>Option A</td>
</tr>
<tr>
<td>A Site and Land Development</td>
<td>3.03</td>
<td>3.03</td>
<td>acre</td>
</tr>
<tr>
<td>B Multi Tenant Building</td>
<td>84,000</td>
<td>140,000</td>
<td>sft</td>
</tr>
<tr>
<td>C Facilities Building /Canteen Building</td>
<td>24,000</td>
<td>2,970</td>
<td>sft</td>
</tr>
<tr>
<td>D Atrium Building /Data</td>
<td>1,400</td>
<td>4,500</td>
<td>sft</td>
</tr>
</tbody>
</table>
### Investment Models

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

The critical factor in choosing an institutional option lies with the mode and financing for 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, and operating and managing the ICT village.

#### Table 2: Comparison of Options

<table>
<thead>
<tr>
<th></th>
<th>Option I: Government Led Model</th>
<th>Option II: O&amp;M Outsourcing Model</th>
<th>Option III: Concession PPP Model (BOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>BHTPA</td>
</tr>
<tr>
<td>Off-site development</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>BHTPA</td>
</tr>
<tr>
<td>Land Development</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>Private Investor</td>
</tr>
</tbody>
</table>
O & M Contractor 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 qualification statements from private operators interested in investing on the project. A short list of the qualified Private Operators will be made, based on evaluation of the statements. After the approval of the short list of Private Operators 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 to help rank and select the most suitable candidates. 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.

The successful investor will be decided based on evaluation of the proposals and subsequent approval of the relevant authorities. The potential Private operator is expected to have the following competences 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 **Option I: Government Led Model** as the base case. Under this model, BHTPA will be responsible for land development, on-site development, financing and O&M of the ICT Village. BHTPA will request government to acquire the land with own fund, donor fund or from government budget allocation. After financing is secured, land development will be undertaken by BHTPA, who will also develop on-site infrastructure such as roads, electricity connections, sewerage etc. After completion of construction of the ICT Village, BHTPA will lease out plots to tenants and receive lease payments in return. It will also be responsible for O&M of the village.

The financial analysis is based on information gathered from BHTPA, market and industry surveys, consultation with relevant stakeholders and free lancer surveys. Estimations of operational costs, cost escalations and financing structure have been made for the financial analysis. The ICT Village is proposed to consist of Multi Tenant Buildings (MTBs) which will accommodate ICT industry companies and also include key ancillary facilities and support services such as cafeteria, data center, banks, gymnasiums, conference hall, dormitory etc. Financial analysis of the development of the ICT Village has been carried out for a period of **30 years** from start of construction of the Park.

In addition to the core business of leasing out office space, BHTPA will also earn revenue from the following commercial facilities in the ICT Village:

- Banks
- Cafeteria
- Data Center
- Conference Center

In addition to the commercial facilities, the following facilities will also be present in the ICT Village:

- Administration office of ICT Village
- Research (R&D) area
- Dormitory
- Gymnasium
- Prayer room
Meeting rooms

The operator of the ICT Village will also be responsible for maintenance of the Park including security. To this end, they will collect a monthly O&M charge from the tenants in addition to the lease charges.

Approximate share of revenue for each revenue source is shown in the following Table 11.17.

**Table 3: Revenue Items**

<table>
<thead>
<tr>
<th>Commercial Facilities</th>
<th>Share of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lease rentals from ICT Units:</strong></td>
<td></td>
</tr>
<tr>
<td>Software Development and Services units</td>
<td>33%</td>
</tr>
<tr>
<td>BPO units</td>
<td>7%</td>
</tr>
<tr>
<td>Training Center</td>
<td>4%</td>
</tr>
<tr>
<td>Other ICT units</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Lease Rental from Data Center</strong></td>
<td>7%</td>
</tr>
<tr>
<td><strong>Lease rentals from Banks</strong></td>
<td>11%</td>
</tr>
<tr>
<td><strong>Lease rentals from Cafeteria</strong></td>
<td>10%</td>
</tr>
<tr>
<td><strong>Lease rentals from Conference Hall</strong></td>
<td>18%</td>
</tr>
<tr>
<td><strong>O&amp;M Service Charge from Tenants</strong></td>
<td>8%</td>
</tr>
</tbody>
</table>

Revenue projection is derived from the demand forecast of space take-up in the ICT Village and the lease rates for office spaces and other commercial facilities. O&M service charge is estimated on a per square feet basis.

The financial model was used to model six different scenarios, including the base case scenario, of different combinations of demand projections and site layout. The three demand forecast scenarios are as follows:

- **Base Case:** Office space take-up in 7 years
- **Optimistic Case:** Office space take-up in 5 years
- **Conservative Case:** Office space take-up in 10 years

The two different master plan layouts were:

- **UH Layout:** Master plan Layout prepared by Urban Habitat Consultants
- **BCL Layout:** Master plan Layout prepared by BCL Associates

Results of the financial analysis of the different scenarios are given in the following table:
Different options demonstrate that the Urban Habitat Layout provides better financial returns for the project. It may also be noted 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 highly dependent on the rate of space take-up in the ICT village, but on other factors such as lease rates, capital cost etc. Overall, financial analyses of the base case and of different scenarios indicate that the project will be financially viable for implementation by the Government.

**Environmental and Social Analysis**

The ICT Village will have environmental impacts through the construction of buildings, and the manufacturing, operation and disposal of devices and network equipment. However it also provides ways to mitigate the adverse effects while also promoting efficient energy use, for example through smart energy saving buildings and well designed telephone activities. The ICT Village at Jessore may be labeled as Orange B category due to its environmental hazard during project construction phase. 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

### Equity IRR

<table>
<thead>
<tr>
<th></th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>11.5%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>11.8%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>11.1%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

### Project IRR

<table>
<thead>
<tr>
<th></th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>11.9%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>12.1%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>11.6%</td>
<td>10.1%</td>
</tr>
</tbody>
</table>

### Average DSCR

<table>
<thead>
<tr>
<th></th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>1.48</td>
<td>1.23</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>1.50</td>
<td>1.24</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>1.46</td>
<td>1.21</td>
</tr>
</tbody>
</table>

### Equity Payback Period

<table>
<thead>
<tr>
<th></th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>20</td>
<td>21</td>
</tr>
</tbody>
</table>

### Project Payback Period

<table>
<thead>
<tr>
<th></th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>15</td>
<td>17</td>
</tr>
</tbody>
</table>
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 only negative impacts during pre-construction stage will be vegetation clearing. During the construction stage, land-raising 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. 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. Impact on soil is not expected to occur as the project does not use any toxic or any chemical for its process and operation. Intervention of flora and fauna and habitats due to setting up the facility and its operation is expected to be negligible. The effect of noise in the operation phase on ambient conditions is also insignificant.

The proposed ICT Village will increase job opportunities, increase land value and demand for houses, opportunities for business, increase infrastructure etc. Involuntary displacement is not applicable for this project.

Project Implementation

The future success of the establishment of the ICT village depends on the proper and timely execution of a number of strategic steps which are outlined below:
The proposed ICT Village project is currently in the design phase. It will take about three years for the construction works to be completed. During the construction period, the authority may work out a plan to kick-start ICT development activities by promoting ICT-based entrepreneurship in that locality. To this end, BHTPA may undertake a pilot programme to set up an incubation ecosystem. A local business incubation ecosystem will help nurture entrepreneurship by providing support to early-stage start-ups. The ICT Village will benefit when these start-up companies become regular occupants after a certain period.

To create an incubation ecosystem, it is imperative to have linkage to both centres of excellence and the IT industry body. The authority may adapt institutional arrangements by entering into a tripartite agreement (TPA) among BHTPA as the executing agency, Jessore Science and Technology University (JSTU) as the centre of excellence and BASIS as the industry body for the ICT sector. Rather than constructing a new building, it will be more cost-effective to set up the incubator at a rented facility where it may continue its operation for about four years. When the proposed ICT Village comes into operation, the incubator can be relocated there permanently.
Background
Chapter 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.

Considering these in view Bangladesh Hi Tech Park Authority decided to create basic infrastructure for establishing IT Village in 47 acres land allocated at Mohakhali, Dhaka and to established 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 ICT Village at Jessore 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 percent from current average rate of 24-25 percent 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 Honourable member gets an opportunity to raise his/her question sequentially. A media center 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 centers 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 ICT Sector.

In 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
Feasibility Study for Jessore Software Technology Park

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 centered 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:
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.

**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 ministry 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 MOICT, Ministry of Post and Telecommunication, S&T Division, and the Ministry of Information has been emphasized. At present, BCC, and High 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 fiber 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

<table>
<thead>
<tr>
<th>Name of the Operators</th>
<th>Number of Subscribers (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BTCL</td>
<td>872</td>
</tr>
<tr>
<td>2. Telebarta</td>
<td>56</td>
</tr>
<tr>
<td>3. Jalalabad Telecom</td>
<td>11</td>
</tr>
<tr>
<td>4. Onetel Communication</td>
<td>40</td>
</tr>
<tr>
<td>5. Westec Ltd</td>
<td>17</td>
</tr>
<tr>
<td>6. Shena Phone</td>
<td>12</td>
</tr>
<tr>
<td>7. S A Telecom</td>
<td>18</td>
</tr>
<tr>
<td>8. Bangla Phone</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,028</strong></td>
</tr>
</tbody>
</table>

*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 have 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
Feasibility Study for Jessore Software Technology Park

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:

<table>
<thead>
<tr>
<th>Category</th>
<th>Subscribers (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Internet</td>
<td>35.12</td>
</tr>
<tr>
<td>ISP and PSTN</td>
<td>1.23</td>
</tr>
<tr>
<td>WIMAX</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36.67</strong></td>
</tr>
</tbody>
</table>

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:

**Figure1.1: Mobile & Fixed Phone Subscribers with Teledensity**

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013 (upto March)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teledensity (%)</strong></td>
<td>24.7</td>
<td>27.9</td>
<td>32.0</td>
<td>38.1</td>
<td>44.6</td>
<td>60.9</td>
<td>64.6</td>
</tr>
</tbody>
</table>

With the purpose of realizing the vision of “Digital Bangladesh”, the Government of Bangladesh has emphasized the need to extend ICT facilities
Feasibility Study for Jessore Software Technology Park

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 1450 KM of optical fiber 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.

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

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<thead>
<tr>
<th>India</th>
<th>Connecting Path</th>
<th>Bangladesh</th>
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<tr>
<td><strong>State-owned Telcos</strong></td>
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<tr>
<td>BSNL</td>
<td>Kolkata – Geddes- Darshana</td>
<td>BTCL</td>
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<tr>
<td><strong>Private ITC Operators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bharti Airtel</td>
<td>Kolkata – Bongaon – Petrapole – Benapole</td>
<td>Fibre@Home Limited</td>
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<td>Summit Communications Ltd</td>
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<td>1Asia Communication (BD) Ltd</td>
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<tr>
<td>Tata Communications</td>
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</table>

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.
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.

**iv) 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 fiber 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 optics cables costs about USD 2.67/per month for 1 kbps connection.

(c) 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 50only. 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 Center (UIC):**

The Union Information Center (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 4501 Union Information Centers 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 Centers and Union Information and Service Centers. 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 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 Centers.

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.

**Free Lancers:**

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 free lancers 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.
IT Incubators

First ICT incubator in Bangladesh started its activities on 1st November, 2002 under the Ministry of ICT with a government grant financing of Tk 3.60 cr. The incubator is located at BRSB Bhaban, KarwanBazar 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 foot 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 Centers

Recently Government of Bangladesh has introduced Call center business which has created new areas for revenue generation for the government. A call center 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 center 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 centers are used by mail-order catalog 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 centers may be used for both domestic and International requirements.
The cost of labour in the call center is quite low compared to other neighboring countries which are a great attraction for the outsourcer for call center business in Bangladesh. Presently the cost of 2MBPS connection for a call center is ranging from US $ 900 to US$ 5,000 per month depending on the size of the seats. Initial investment for a call center 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 hour 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 center. 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 center business. 72 of these call centers are in operation in Bangladesh now. employing about 20,000 professionals. (Budget speech 2013). From the interview with the President of Bangladesh Call Center Outsourcing (BACCO), it is gathered that these companies are at present earning about Tk 12.0 crore revenue per year. 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 centers is estimated to increase to 200,000 by 2021.

In domestic and International market customer care through call centers is increasing rapidly. Because of the improved quality and professionalism many of the organizations consider the use of call centers 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 center 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 centers. 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 centers 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 centers through education reform and capturing call center 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 honourable Prime Minister, during her visit at Jessore (a district under Khulna Division) on 27 December 2010, promised to establish an IT park there as part of Government’s ‘Digital Bangladesh’ concept. Following her commitment, the project titled ‘Establishment of Jessore Software Technology Park’ has been taken up by the Bangladesh Hi-Tech Park Authority (BHTPA). The project got the approval of ECNEC on 05 March 2013.
The objective of the ICT Village project is to establish knowledge based industries throughout the country, particularly related to Software and IT Enabled Services. This will not only contribute to the national economy, it will also help achieve the goals of Vision 2021: Digital Bangladesh. The Government of Bangladesh intends to create the basic infrastructure for establishing an ICT Village in 3.03 acres land allocated at Barandi Mouza, Jessore. 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 ICT Village/STP in Jessore.

iii. To construct a Multi Tenant Building (MTB) and other utilities services at the allocated land for ICT Village in Jessore 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 village 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 centers, Training centers, hardware suppliers along with all recreational facilities for the user of the ICT Center.
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

Bangladesh Hi-Tech Park Authority (BHTPA), under the Ministry of Information & Communication Technology (MoICT) intends to develop IT villages in the cities of Jessore, Rajshahi, Khulna, Sylhet, Rangpur, Chittagong and Dhaka. The major objective of the project is to establish knowledge based industries in Bangladesh related to IT/ITES in order to contribute to the national economy. Subsequently BHTPA has signed an agreement with IIFC for the feasibility study for the development of above mentioned ICT Villages. In accordance with the Consulting Services Agreement, IIFC has prepared the Feasibility Study for the Development of an ICT Village at Jessore as the 2nd site of the assignment.

1.4 Brief Scope of Work and Approach

IIFC has been given the assignment for feasibility study keeping in view of their Technical aspect, Commercial aspect and Environmental and social aspects of each of the ICT Villages including Jessore. Scope of work of the Consultants in preparing the Feasibility Study for the development of an ICT Village at Jessore was to 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 social and environmental analysis of the site and conduct financial analysis through financial modelling.

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 at Jessore.

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 and Jessore to obtain their feedback in the development of an ICT Village at Jessore. 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 IT Villages through market survey for assessment of the needs and also identified companies that may relocate or open subsidiaries in the proposed IT 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 and financial analysis and a preliminary cost estimate for the project.
2

IT/ITES Industry Analysis In Bangladesh
IT/ITES 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 center 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 ITE 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 & 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 centers, 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 Centers 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 center 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 Center 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 high tech sector in Bangladesh and thereby earn foreign currency.

7. Assist in generating new employment and human resource for the call center market.

As of now there are about 245 call centers 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:

- To unite and encourage all computer vendors to join in one platform for achieving their common interest
In Bangladesh every year, on an average over 300,000 PCs are imported. There are about 10,000 vendors 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 centers. 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 areas 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 employs about 70,000 skilled individuals including about 15,000 agents working in the call centers. Besides this, about 40,000 people work as free lancer. 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 centers. 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 favourable 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 and 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. Also, 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 [Characteristics & Potential Evaluation]

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 US $800 million (BASIS 2012), the software industry takes up 44% (US $352 mn) and ITES is about 56% (448 mn). 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 40000 freelance professionals in Bangladesh, earning on average revenue of about US $ 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, website 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 devices. 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 population 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 5000 software graduates. Initiatives are underway to introduce computer science at secondary school level. The numbers of IT graduates are small compared 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 built 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 neighboring 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 to develop 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 compared to our neighboring 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 be 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 centers 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 devises.

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**

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

*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 and 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 (the value of growth rate in Bangladesh is unsteady and this can be partly explained by a change of accounting methods).
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 the MOICT and allocations on ICT related projects under the Ministry of Telecommunications.

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Allocation</th>
<th>GOB</th>
<th>Project Aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2009-10</td>
<td>464.70</td>
<td>358.00</td>
<td>106.70</td>
</tr>
<tr>
<td>2. 2010-11</td>
<td>381.89</td>
<td>288.43</td>
<td>93.46</td>
</tr>
<tr>
<td>3. 2011-12</td>
<td>1821.40</td>
<td>350.99</td>
<td>1470.41</td>
</tr>
<tr>
<td>4. 2012-13</td>
<td>1202.83</td>
<td>262.71</td>
<td>940.12</td>
</tr>
<tr>
<td>5. 2013-14 (Original ADP)</td>
<td>14.56</td>
<td>5.24</td>
<td>9.32</td>
</tr>
</tbody>
</table>

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)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Grameen phone (Jan – Sep)</th>
<th>Banglalink (12 months)</th>
<th>Robi Telecom (12 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1,253.57</td>
<td>1,502.50</td>
<td>1,629.45</td>
</tr>
<tr>
<td>2010</td>
<td>591.70</td>
<td>1,172.10</td>
<td>1,205.78</td>
</tr>
<tr>
<td>2011</td>
<td>577.67</td>
<td>4,236.10</td>
<td>86.24</td>
</tr>
<tr>
<td>2012</td>
<td>1,970.27</td>
<td>773.20</td>
<td>104.58</td>
</tr>
</tbody>
</table>
Institutional Arrangement
3 INSTITUTIONAL ARRANGEMENT

3.1 Role of Government in the ICT Sector

With regards to ICT, the government has two roles to play; 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 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 center 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**

<table>
<thead>
<tr>
<th>Ministries/Division/Agencies</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prime Office</td>
<td>Policies and Guidelines of implementing Digital Bangladesh Program</td>
</tr>
<tr>
<td>3. Science and Technology Division</td>
<td>Promote Science and Technology in the Society to nurture entrepreneurship in the society, Implementation of nuclear power and promote development of local technologies.</td>
</tr>
<tr>
<td>4. Ministry of Post And Telecommunication</td>
<td>Building and maintenance of Telecommunication Infrastructure</td>
</tr>
<tr>
<td>6. Planning Division</td>
<td>Secretarial Support to ICT Task Force</td>
</tr>
<tr>
<td>7. Ministry of Education</td>
<td>Curriculum for IT Education, Computerization at schools, Education Policy</td>
</tr>
</tbody>
</table>
### Chapter 3: Institutional Arrangement

<table>
<thead>
<tr>
<th>Ministries/Division/Agencies</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| 8. 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 |
| 9. Bangladesh Telecommunication Regulation Commission | - Regulations for Telecommunication system providers  
- Licensing Authority for IPS, Private telephone/Mobile operators, Call Centers 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 |
| 10. 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 |
| 11. Ministry of Information | - Right to Information Act |
| 12. Bangladesh Bank | - Regulation on Fund Transfer  
- Mobile Banking & Credit Card based transaction System  
- Automated Clearing House system  
- Bangladesh Payment and Settlement system regulations 2013 |
- PPP Model Projects |
3.3 Regulatory Authority and Functions

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

1. Ministry of ICT
2. Bangladesh Computer Council
3. Bangladesh High Tech Park Authorities
4. Ministry of Post and Telecommunication
5. Ministry of Commerce
6. Ministry of Information
7. Bangladesh Bank
8. Bangladesh Telecommunication Regulatory Commission

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

3.3.1 Ministry of Information and Communication Technology

MOICT 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
Feasibility Study for Jessore Software Technology Park

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 MOICT. These are BCC and Bangladesh High Tech Park Authority (BHTPA)

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;
Feasibility Study for Jessore Software Technology Park

(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 High 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) is 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 Centers, IP Telephony System, Vehicle Tracking Service, WIMAX Services, Third Generation (3G) Telephone, Submarine Cable System and Services etc.

3.3.5 Ministry of Post and Telecommunication

The primary function of the MoPT 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 which can be found in the Annex of this Report.

3.3.6 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 communiques, press notes, handouts, etc.

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


(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.

### 3.3.7 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

### 3.3.8 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.
Feasibility Study for Jessore Software Technology Park

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 Computer council Act 1990
b. BTRC Act
c. Telecommunication Act
d. Hi Tech Park Act
e. ICT Act
f. Intellectual Property Rights Act 2010
g. Right to Information Act 2009
h. Certifying Authorities Rule 2011
i. Digital Certificate Interoperability guidelines
j. Regulation on Electronic Fund Transfer
k. Mobile Financial Services 2011
l. Bangladesh Payment and Settlement System Regulation 2013

3.5 Proposed Regulatory Framework

(A) Present situation:

Government of Bangladesh has recognized the importance of establishing the IT 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 centers, 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

<table>
<thead>
<tr>
<th>Issues</th>
<th>Facilities /Incentives Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Exemption</td>
<td>Generally 5 to 7 years</td>
</tr>
<tr>
<td>Duty</td>
<td>No import duty for export oriented industry. For other industries it is 5% ad valorem</td>
</tr>
<tr>
<td>Tax Law:</td>
<td>i. No Double taxation</td>
</tr>
<tr>
<td></td>
<td>ii. Exemption of income tax upto 3 years for the expatriate employees.</td>
</tr>
<tr>
<td>Remittance:</td>
<td>Facilities for full repatriation of invested capital, profits and dividends in most situations</td>
</tr>
<tr>
<td>Exit:</td>
<td>An investor can wind up any time and can repatriate the sales proceeds after securing proper authorization.</td>
</tr>
<tr>
<td>Ownership:</td>
<td>Foreign investor can set up ventures either wholly owned or in joint collaboration with local partner.</td>
</tr>
<tr>
<td>Investing in the Stock Market</td>
<td>Foreign investors are allowed to participate in initial primary offerings (IPOs) without any regulatory restrictions. Also, incomes from dividends are tax-exempt for investors.</td>
</tr>
<tr>
<td>Non Resident Bangladesh’s (NRB)</td>
<td>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.</td>
</tr>
</tbody>
</table>

(B) 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 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 infrastructure.

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.
Location of The Project: Jessore
4 LOCATION OF THE PROJECT: JESSORE

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 Jessore.

The project got the nod of Executive Committee of the National Economic Council (ECNEC) on 5th March, 2013. The total estimated cost of the Project is BDT 479.53 million. The Jessore IT Park is expected to be built on 3.03 acres of land located in Barandi and Shonkorpur Mouza of the Sadar Upazila of Jessore District in Khulna Division.

4.1 Jessore Background

Jessore district falls within the Khulna division. The district of Jessore is bordered by Jhenaidah and Magura districts on the north; Satkhira and Khulna districts on the south; Narail and Khulna districts on the east; and West Bengal of India on the west. The district of Jessore lies between 22°10’ to 89°16’ east longitudes. Its elevation is 8 meters above mean sea level and the area is nearly slope from north to south.

The distance, by road, between Dhaka and Jessore is approximately 353 km. There are adequate bus services carrying passengers between Jessore and Dhaka. Transportation by railway is also available. In particular, Jessore is a junction on the expansive Eastern Railway. The Eastern Railway network extends into Indian Territory and links the capital of Bangladesh, Dhaka with the Indian city of Kolkata; Jessore falls midway in this route.

In addition to road and railway, air transportation is also available. There are currently three airlines out of which Regent Airways and United Airways operates regular flights twice daily from Dhaka to Jessore and another airline, Novo Air operates a single flight daily.

4.2 Electricity and Internet

Of the total number of households in Jessore, 65.8% use electricity as a source of light. There are, moreover, approximately 27,770 persons of which 86.3% are male and 13% are female, with access to internet in Jessore (BBS, 2011). The government of Bangladesh recently introduced one stop citizen service in all Deputy Commissioner’s offices of the country, including Jessore. Thus citizens of Jessore have access to and can submit documents online; those without internet access can do so through local e-service centers. There are also about 15 lakh persons out of which 52.4% are male and 47.6% are female, who watch Television regularly.

There are also 23 separate banks with multiple branches in Jessore. As a result, access to credit at competitive rates is available in the area.
4.3 District Demography with respect to ICT Sector

The district of Jessore consists of Abhaynagar, Bagherpara, Chaugachha, Jhikargacha, Keshabpur, Jessore Sadar, Manirampur, and Sharsha. The total area of Jessore District is about 2,578.20 sq km, and its population as per the census of 2011 is 27 lakhs. Thus the population density of Jessore District is 1,060 people per sq km (BBS, 2011).

From the “Population and Housing Census 2011” conducted by the Bangladesh Bureau of Statistics, it was found that there were 761,848 individuals in the 15-29 age group in Jessore; this is about 27.5% of the Jessore population. Within the 15-29 age group, the total number of students stands at 172,482 out of which 74,817 are female. Thus there is a large young population able to enter the IT/ITES industry.

4.4 Literacy Rates and Education

A high literacy rate of 79.4% exists between the 15-29 age group of the population. Comparatively, the 15-19 age groups have a higher literacy rate of 87.1%. Females did much better in the 15-19 and 20-24 age groups than their male counterpart and raised the average. Literacy rate among females was as large as 89% for the 15-19 age groups (Annex B). In addition to basic literacy, approximately 1% of the 15-29 age groups know English as a second language; this amounts to about 7,618 individuals.

The main occupations in Jessore are related to agriculture. Of the local labour force, 39.84% are agriculture; 24.13% are agricultural labourers; 2.68% are wage labourers; 11.99% are commerce labourers; 8.66% are service labourers; 1.41% is industry labourers; other sources make up 8.18% (BBS Census 2011).

Roughly half of Jessore’s population is located within urban areas. The literacy rate in urban parts of Jessore stands at 68.57%, which is significantly higher than the overall district of Jessore (BBS, 2011). Thus the urban parts of Jessore are a much better source of skilled labour for the IT/ITES industry.

4.5 ICT courses in Educational Institutions

Jessore has one Science and Technology University, one government polytechnic Institute, eight private polytechnic Institutes, one Computer management college, 45 Degree Colleges (Annex C), 33 intermediate colleges (Annex D) and 13 School cum Colleges (Annex E). Compulsory computer courses are included in most of the institutes throughout the country.

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

- Computer Science and Engineering (CSE)
- Electrical and Electronic Engineering (EEE)
Feasibility Study for Jessore Software Technology Park

- Electronics and Telecommunications Engineering (ETE)
- Applied Physics and Electronics (APE)
- Mathematics (Math)
- Statistics (Stat)
- Management Information Systems (MIS)

Yearly enrolment of students in different degree programs in universities in Jessore and around which can be seen from the table below:

Table 4.1: Enrolment of Students for ICT Education in different universities in Jessore

<table>
<thead>
<tr>
<th>SI No</th>
<th>Name of Universities</th>
<th>CSE</th>
<th>EEE</th>
<th>ETE &amp; APE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jessore Science and Technology University</td>
<td>50</td>
<td>35</td>
<td>30</td>
<td>115</td>
</tr>
<tr>
<td>2</td>
<td>Khulna University</td>
<td>40</td>
<td>40</td>
<td>45</td>
<td>125</td>
</tr>
<tr>
<td>3</td>
<td>KUET</td>
<td>60</td>
<td>120</td>
<td>60</td>
<td>180</td>
</tr>
<tr>
<td>4</td>
<td>Islamic University, Kushtia</td>
<td>60</td>
<td>120</td>
<td>60</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>210</td>
<td>195</td>
<td>255</td>
<td>660</td>
</tr>
</tbody>
</table>

Source: UGC Annual Report, 2012

The polytechnic Institutes provides Diploma in Computer Science and Engineering (CSE), Electrical and Electronic Engineering (EEE), and Telecommunication Engineering. As per data collected from Bangladesh Technical Education Board, the yearly intake (Session 2012-13) of students in IT related discipline in nine Polytechnic Institutes in Jessore is 1,103. In addition to these Institutes a large number of students are enrolled in 56 different Polytechnic Institutes surrounding Jessore under Khulna Division. The list of such Institutes is given in Annex D (ii). The enrolment of students in IT discipline in surrounding areas is 3,793, totalling a resource of IT skilled students of 4,917 from the Polytechnic Institutes. The detail enrolment statistics as per Bangladesh Technical Education Board is shown below:

Table 4.22: Enrolment of Students for ICT Education in different Polytechnic Institutes in Jessore

<table>
<thead>
<tr>
<th>SI No</th>
<th>Name of the Institute</th>
<th>Yearly Enrolment of Students in IT/IT related Disciplines</th>
<th>CSE</th>
<th>EEE</th>
<th>Telecom</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jessore Polytechnic</td>
<td></td>
<td>89</td>
<td>184</td>
<td>88</td>
<td>361</td>
</tr>
</tbody>
</table>
## Chapter 4: Location of The Project: Jessore

### Feasibility Study for Jessore Software Technology Park

#### Yearly Enrolment of Students in IT/IT related Disciplines

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the Institute</th>
<th>Yearly Enrolment of Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CSE</td>
<td>EEE</td>
</tr>
<tr>
<td>2</td>
<td>BCM College of Engineering and Technology</td>
<td>53</td>
<td>131</td>
</tr>
<tr>
<td>3</td>
<td>Muslim Aid Institute of Technology</td>
<td>58</td>
<td>96</td>
</tr>
<tr>
<td>4</td>
<td>Model Polytechnic Institutes</td>
<td>58</td>
<td>114</td>
</tr>
<tr>
<td>5</td>
<td>Bangladesh Technical College</td>
<td>12</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Kopotakho Polytechnic College</td>
<td>-</td>
<td>34</td>
</tr>
<tr>
<td>7</td>
<td>City Polytechnic Institutes</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>8</td>
<td>Tokyo Bangla Polytechnic Institutes</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>Monirampur Model Polytechnic Institutes</td>
<td>-</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td><strong>Sub Total</strong></td>
<td><strong>270</strong></td>
<td><strong>727</strong></td>
</tr>
<tr>
<td>10</td>
<td>Other Private Polytechnic Institutes Surrounding Jessore (List in Annex)</td>
<td>1,035</td>
<td>2,733</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>1,305</strong></td>
<td><strong>3,460</strong></td>
</tr>
</tbody>
</table>

Source: Bangladesh Technical Education Board (Session 2012-13)
Yearly IT Graduates from Jessore and its surrounding universities are 660 and the IT professionals mostly Diploma holders from Polytechnic Institutes of Jessore and its surroundings is 4,917. When added together the total number of IT skilled professional will stand at 5,577. 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. As human capital is the most important component in developing and sustaining the IT-based services industry, it is necessary to strengthen training infrastructure for meeting IT sector manpower requirements through partnerships with global IT training institutes.

### 4.6 ICT Sector Growth and Investment Trend in Jessore

The overall growth of ICT sector in Bangladesh is 40% per year (BASIS) while the global growth is 16% per year (WB Report). The activities of IT/ITES are mainly located in Dhaka. At present IT/ITES in Jessore is very limited. The services mainly comprises of hardware vendors and few Cyber café. There is a growth of Hardware vendors in Jessore which can be seen from Chapter 5 indicating that the demand of IT related work is increasing.

### 4.7 Site Location and Description

The site is located at 23°09′ 21″ N to 89°13′20″ E and about 2 km from the Jessore city centre. It is approximately 8 km away from Jessore Airport and about 3 km from the railway station. The aerial snap-shot of Jessore ICT Village site in the Google Map is shown below:

**Figure 4-1: Aerial Snap-shot of Jessore ICT Village Site**
The north and west side of the site has a road with access to the site. To the west are the Jessore Regional Passport Office and the Technical Training Centre. There is a public library in the north-west corner. In the south-west corner is a six-storied apartment building of Department of Social Services (DSS).

### 4.8 Land Use Designation

The land area of the proposed site for the development of ICT Village is 3.03 acres from two different mouzas — 2.25 acres of land from the Barandi mouza of J.L no. 91 and 0.78 acre from Shankarpur mouza of J.L. no. 82. The site is a non-arable flat land with a shallow ditch in the middle. It is almost vacant and no structures or settlements are identified on the site except two semi-pacca houses which are being used as residential purpose by the fourth class employees of PWD. There are six families staying in these houses for more than 15 years. PWD will take necessary steps to relocate them as soon as the construction work starts. The local households are situated around the periphery of the proposed site.

Additionally, there is also a piece of land measuring 6.0 acres, readily available very close to the present site, which can be used in case future expansion is required.

### 4.9 Ownership

The land was previously owned by Public Works Department (PWD) and intended for developing a brick field. Ministry of Land gave their concurrence to handover these three acres of land from Barandi Mouza and Shankarpur Mouza to the Ministry of Information and Communication Technology (MoICT) by transferring ownership from Public Works Department (PWD). The transferring process was carried out under section 75 of “Acquisition of Immovable Property Manual 1997”. There is no dispute over the land and no legal impediments to use the land for developing the proposed ICT Village on the site. The details of the land schedule are shown below:

**Table 4.3: Details of Land Schedule of the Proposed Site**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jessore and Jessore Sadar</td>
<td>Barandi, J.L.-91</td>
<td>09</td>
<td>2884</td>
<td>0.99</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09</td>
<td>2885</td>
<td>2.24</td>
<td>0.2750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09</td>
<td>2886</td>
<td>0.34</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09</td>
<td>2887</td>
<td>0.23</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>259</td>
<td>2901</td>
<td></td>
<td>0.62</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>259</td>
<td>2902</td>
<td></td>
<td>0.35</td>
<td>0.35</td>
</tr>
</tbody>
</table>
Chapter 4: Location of The Project: Jessore

### Feasibility Study for Jessore Software Technology Park

**Table 4-1: Land Details**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>261</td>
<td>2903</td>
<td></td>
<td>0.22</td>
<td>0.1450</td>
</tr>
<tr>
<td></td>
<td>258</td>
<td>2904</td>
<td></td>
<td>0.28</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>320</td>
<td>2905</td>
<td></td>
<td>0.43</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>2906</td>
<td></td>
<td>0.52</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>2.25</strong></td>
</tr>
<tr>
<td>Shankarpur, J.L.-82</td>
<td></td>
<td>944</td>
<td></td>
<td>0.36</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>945</td>
<td></td>
<td>0.54</td>
<td>0.54</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.78</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>3.03</strong></td>
</tr>
</tbody>
</table>

**Figure 4-2: Sketch Map of the Proposed Site**
4.10 Offsite Infrastructure to the Site

4.10.1 Access Road

Jessore-Khulna Highway, also known as Jessore-Khulna National Highway (N7), is the main highway that connects Jessore with Dhaka. The Project Site is situated at about half a kilometre from this and linked with an access road which is locally known as Nazirshankarpur Road. Nazirshankarpur is a single lane road with a width of 5 m, which is at present in poor condition. It ends up with a feeder road known as Rail Road. The road is bounded on either side by numerous settlements and widening of this access road is necessary. The major socio-economic infrastructures and their approximate distance from the project site are shown below.

Figure 4-3: Major Socio-Economic Infrastructures and the Project Site

![Map showing location and infrastructures around the project site.]

4.10.2 Power Supply

Reliable power supply stands out as the most important feature that an ICT Village can offer to its tenants. The nearest sub-station (33/11 kV) for power supply is situated within 1km from the project site at Bajpara. The second nearest sub-station is located at Chanchra, which is 2.5 km from the site. Both the stations with capacity of 2X10 MVA are owned and maintained by West Zone Power Distribution Company Limited (WZPDCL), an enterprise of Bangladesh Power Development Board (BPDB). However, for ensuring dependable and reliable power supply and maintaining redundancy, the ICT Village may be connected with both the sub-stations through express feeder line. To ensure continuous power supply, a sub-station with a capacity of 1,000 kVA needs to be set up inside the Village.
4.10.3 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 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.

4.11 Site Suitability with Respect to Outsourcing Business

4.11.1 Overview of Indian ICT Industry

The IT & ITES industry, as a whole, is the mainstay of Indian technology sector as it has driven growth of the economy in terms of employment,
revenue generation, standards of living etc and has played a major part in placing the country on the global canvas.

Indian IT industry has built up an enormous confidence for itself in the global markets. IT industry in India comprises of software industry and information technology enabled services (ITES), which also includes business process outsourcing (BPO) industry. India is considered as a pioneer in software development and a favourite destination for IT-enabled services.

As of today, in India IT/ITES industries are highly localized and clustered in seven Indian cities. These places include Bangalore, Hyderabad, Chennai, Gurgaon/Noida/New Delhi, Kolkata, Mumbai, and Pune. Due to infrastructure limits and scarcity of land the geographical spread is gradually expanding to cover Ahmedabad, Bhubaneshwar, Chandigarh, Coimbatore, Jaipur, Kochi, Madurai, Mangalore, Mysore, and Trivandrum. It is estimated that over 80% of IT units in India are SMEs and they constitute only 30% of the entire IT exports from India. Access to high quality education has created a growing pool of resources.

There are a large number of multi-national IT enterprises operating in India in sectors such as: Integrated Chip Design, System software, communication software, R&D Centres, Technology Support sector, captive support sector, BPO Sector etc reaping the cost and quality advantages.

4.11.2 Potentiality of multinational companies in outsourcing business to Bangladesh

Bangladesh emerges as a rapidly growing destination which offers several competitive advantages. Bangladesh offers an attractive business opportunity for multinationals interested in outsourcing or off shoring. This value proposition is drawn from the following strengths

1. Labor availability and scalability

Bangladesh demographics may provide a constant supply of resources at extremely competitive costs. Bangladesh has amongst the lowest IT/ITES labour cost in comparison to countries such as India, China and Pakistan. This is a major strength, as labour is the largest cost component across most IT/ITES segments. Due to the competitive wage structure, it can serve as a strong driver for attracting investments for cost arbitrage.
### Table 4.4: Wage rate Comparisons for Competing Cities

<table>
<thead>
<tr>
<th></th>
<th>Bangladesh</th>
<th>India</th>
<th>Karachi</th>
<th>Colombo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineers (USD per month)</td>
<td>142-192</td>
<td>187-387</td>
<td>494</td>
<td>162-253</td>
</tr>
<tr>
<td>Managers (USD per month)</td>
<td>378-598</td>
<td>522-1,020</td>
<td>1,146</td>
<td>309-767</td>
</tr>
</tbody>
</table>

2. **Language Skills**

Bangladesh offers a ready pool of English speaking resources, with limited accent neutralization needs.

3. **Growing Education-Industry linkages**

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.

4. **Low Total Cost of Operations**

Real estate, resources and attractive taxation policies help lower the total cost of operations compared to the other outsourcing destinations.

4.11.3 **Potentiality of Indian ICT companies in outsourcing business to Jessore ICT Villages**

The government of West Bengal is pulling out all stops to showcase the potential of Kolkata as an IT destination. Tata Consultancy Services (TCS), Cognizant Technology Solutions (CTS), IBM Global Services, Wipro Technologies, Siemens Information Systems, CMC Limited and The Chatterjee Group (TCG) have already established a presence in Kolkata and many of them have definite plans to expand their operations here. Although, national companies like TCS and CMC Limited came in Kolkata long before the government’s awakening. The GE Capital, Wipro Spectramind and Reliance group are in the process of building facilities in the city. West Bengal is the first state in the country to declare the IT industry as a public utility service.

The proposed ICT village at Jessore will be very suitable for the Kolkata based ICT companies in outsourcing their businesses to the area to cater to their local demand. The following factors will attract the companies in outsourcing their business to Jessore ICT village:

1. **Cheap Labor Cost**

The ability to operate at low cost is one of the prime value propositions for outsourcing, a major advantage possessed by Bangladesh. The significant pool of young and entrepreneurial work force is available at a much lower
wage than other major outsourcing countries. Entry level wages in Bangladesh’s IT industry, are over 50% cheaper than other countries in Asia-Pacific like India, Philippines, Malaysia, Sri Lanka, Thailand and Vietnam.

2. **Location of the Site**

The site is very close to West Bengal. The Jessore ICT village site is adjacent to Kolkata. The distance, by road, between Jessore and Kolkata is approximately 122 km. The travel time between Jessore to Kolkata by road is approximately 2 hours.

![Map of Jessore and Kolkata](image)

3. **Cultural/ethnic similarity – language**

While 80% of the population in West Bengal is Hindu, 80% of the population is Muslim in Bangladesh. Despite religious differences, there are cultural similarities, which mean that a person from Kolkata feels culturally similar to a Bangladeshi than a Marathi or a Gujarati person. This is mainly because of Bengali language, which is the official language in both Bengals (West Bengal and Bangladesh). The accent between Bangladeshi and West Bengalis are different although the language Bengali is same. Also Hindi language plays a vital dominance to the basic ground of Bangla language. More specifically children as well as adult of Bangladesh are getting oriented with so many Hindi words very easily through cartoons, Bollywood songs, daily soap and so on aired by different Indian satellite channels. This is how Bangladeshi citizens are acquiring and learning Hindi language very easily.

4. **High capacity optical Fiber link between India and Bangladesh through Petrapole-Benapole boarder**

The high capacity terrestrial optical fiber link which extends from Bongaon in West Bengal to the Petrapole-Benapole border will enhance voice and data
connectivity between the two countries as well as transit traffic between Bangladesh and the rest of the world. This commencement of terrestrial optical fiber connection between India and Bangladesh will be a key catalyst for Bangladesh’s future growth in telecommunication. This will enable Bangladesh to connect to the rest of the world with improved voice quality and high speed data. The cable is further interconnected with the fiber backbone constructed from the Benapole border to Dhaka by the ITC (International Terrestrial Cable) licensees in the region. This alternate international gateway to Bangladesh will offer dual path connectivity ensuring high uptime and service levels.
Market Survey
5 MARKET SURVEY

A survey was carried out on a small number of ICT companies, to make a market demand forecast for the proposed ICT Village at Jessore. The survey methodology and the findings are presented below.

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 Jessore, IIFC surveyed the ICT companies at Jessore as well as 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 and 18 Companies at Jessore. Apart from the ICT companies, IIFC team surveyed 22 freelancers through development of online survey form.

<table>
<thead>
<tr>
<th>ICT Companies/ Freelancers</th>
<th>No. of Companies/Freelancers Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Companies at Dhaka</td>
<td>50</td>
</tr>
<tr>
<td>ICT Companies at Jessore</td>
<td>18</td>
</tr>
<tr>
<td>Freelancers</td>
<td>22</td>
</tr>
</tbody>
</table>

5.1.2 Choice of Companies

Since the ICT village will be located at Jessore, it was decided to carry out the survey among companies located at Jessore city. IIFC team also surveyed ICT companies at Dhaka to assess their willingness to expand their business to proposed ICT Villages at Jessore.

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 cases, how to get answers without asking the question directly etc.
ICT companies are very limited in number at Jessore and most of them are hardware based. Therefore, sample size for survey of Jessore ICT companies is based on the existing companies. IIFC collected the list of Jessore ICT companies from Bangladesh Computer Samity (BCS). The sample size is considered as 18 companies, which is almost 100% of total population.

The 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. The businesses are categorized into the following types:

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

IIFC selected the companies that have mixture of these types of business. A list of regular active freelancers was also collected from BASIS. In this regard, IIFC developed an online survey questionnaire form. The form was sent to the listed freelancers, who were requested them to fill them up within a specified time period.

5.2 Survey Questionnaire

Three sets of questionnaire were prepared by IIFC separately for ICT companies at Dhaka and Jessore and also for Freelancers. The survey questionnaires are provided in Annex F.

5.3 Survey Findings

The raw data was 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 analyzed below.

5.3.1 Findings from ICT Companies Surveyed

a. Growth

The following table shows the last four years income growth of ICT companies in Jessore. According to the survey, in year 2009 there is a high growth rate. However, it suddenly falls down in year 2010 with respect to year 2009 and in year 2012 with respect to year 2011.
Overall the survey found that there is a great potential for growth, which has been retarded recently mainly due to various reasons. The reasons behind this decreasing trend are lack of proper facilities for doing businesses, like low rent office space, lack of other physical facilities like nonstop/ stable power supply, internet connectivity, water, gas, telephone etc.

The above figure shows that 91% of companies in Jessore fall within the income range of USD 0-150,000 (up to Tk. 1.2 cr). Very few companies (6% and 3% of companies) fall within the income range of > USD 150,000-650,000 (Tk. 1.2 – 5 cr) and >USD 650,000-1.25 m (Tk 5 – 10 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.
Surveyors 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 18 ICT companies surveyed in Jessore are shown in the following table:

**Table 5.2: Utility Expenses**

<table>
<thead>
<tr>
<th></th>
<th>Space Rental (Tk./sq. ft)</th>
<th>Electricity bill (Tk./month)</th>
<th>Fuel cost for generator (Tk./month)</th>
<th>Bandwidth Cost (Tk./month)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Av. value</strong></td>
<td>14.86</td>
<td>4,150</td>
<td>1,810</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>No. of companies</strong></td>
<td>18 (all)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table, it can be concluded that space rental of Tk. 14.86 per sq. ft is quite reasonable and cheap. Electricity bill and fuel cost are also not so high. This is because major proportion of ICT Industry in Jessore constitutes of very small companies. Average bandwidth cost is also very low. As most of the companies conduct hardware based business, their requirement for bandwidth is very low.

The following table shows the category wise utility expenses:

**Table 5.3: Utility Expenses (category wise)**

<table>
<thead>
<tr>
<th>Type of Services</th>
<th>Requirements</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Software Development and Services</strong></td>
<td>257 1 3,817 10,000 1,800 1,500</td>
<td></td>
</tr>
<tr>
<td>1. <strong>Hardware Sales and Services</strong></td>
<td>556 0.5 8,259 4,000 3,759 1,510</td>
<td></td>
</tr>
</tbody>
</table>

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


c. **Interest to expand/relocate business to the proposed ICT Village**

An overwhelming interest in expanding/relocating business to the proposed ICT village was seen when a question on this issue was asked to ICT companies in Jessore.

**Table 5.4: Interest to expand/relocate business to the ICT village at Jessore**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Companies</td>
<td>18</td>
<td>0</td>
</tr>
</tbody>
</table>

During the survey of ICT companies in Dhaka, it was also noticed that 22% (7 out of 32) companies were interested in outsourcing/sub-contracting work-orders to proposed ICT village at Jessore.

**Figure 5-3: Interest in outsourcing/sub-contracting work-orders to Jessore ICT Village**

The survey showed that 20% (7 out of 35) companies shown their interest to expand their business from Dhaka to Jessore ICT village.
d. Space Requirement

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

Table 5.5: Space Requirement to set up Business at Jessore ICT Village

<table>
<thead>
<tr>
<th>Space (sft)</th>
<th>No of Companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 sft</td>
<td>5</td>
<td>28%</td>
</tr>
<tr>
<td>1,000 sft</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>1,500 sft</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>2,000 sft</td>
<td>1</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

It appears that the majority responded for 1,000 to 1,500 sft space for business.

e. Facilities Needed in the Village

The following figure ranks the importance of different facilities expected by the ICT companies at Jessore to set up business at ICT Village.
It is evident that reliable power supply is the most important factor with cheap rent/cost of land following. A secured business environment, Strong customer base are the other important factors ranking third and fourth respectively. Reliable internet connectivity, fiscal incentives (tax holidays, loans etc.) come next and having similar importance. Qualified Professionals/graduates in the park and Value-added services (Market access, business planning and operational support, or resource mobilization) get the lowest rankings.

On the other hand, the following figure shows the facilities expected in the ICT villages by the Dhaka based ICT companies who want to expand their business in Jessore.

Figure 5-6: Importance of Different Facilities to relocate/expand business to Jessore ICT 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 and Value-added services (Market access, business planning and operational support, or resource mobilization) also get the lowest rankings.

1. **Expected Ancillary Facilities in the Village**

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

**Figure 5-7: Importance of Different Ancillary Facilities in the Village**

![Bar chart showing the importance of different ancillary facilities.

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

On the other hand, the following figure shows the ancillary facilities expected in the ICT villages by the Dhaka based ICT companies who want to expand their business in Jessore.
Above figure shows that R&D Centre stands out as the most important facility with availability of training centre 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

g. 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. Very few freelancers (5%) fall within the income range of $1,600-$2,000 and $2,600 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, 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.

**h. Utility Expenses**

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

<table>
<thead>
<tr>
<th>Component of Earnings</th>
<th>Bandwidth Requirement (Mbps)</th>
<th>Bandwidth Cost (Tk./month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings from Design &amp; Multimedia</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Earnings from Web Development</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Earnings from Sales &amp; Marketing</td>
<td>10%</td>
<td>22%</td>
</tr>
<tr>
<td>Earnings from Software Development</td>
<td>20%</td>
<td>26%</td>
</tr>
<tr>
<td>Earnings from Customer Service</td>
<td>25%</td>
<td>28%</td>
</tr>
<tr>
<td>Earnings from Business Services</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Earnings from Networking &amp; Information Systems</td>
<td>35%</td>
<td></td>
</tr>
</tbody>
</table>

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

**i. Willingness to work on the proposed ICT Village**

Very few freelancers have shown their interest to work on the proposed ICT village at Jessore was seen when a question on this issue was asked to the freelancers. The following figure shows the results of the responses.
During the survey of freelancers, it was also noticed that only 5% (1 out of 22) freelancers have shown their interest to work on the Jessore ICT village.

### j. 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 5-10: 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.
### Expected Ancillary Facilities in the Village

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

![Bar Chart]

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 Jessore have two type of business i.e. (1) software development and services and (2) hardware sales and services. However, in Jessore 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 (sq. ft).

<table>
<thead>
<tr>
<th>Type of Services</th>
<th>Average Bandwidth (Mbps)</th>
<th>Average Space Requirement (sq. ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Development and Services</td>
<td>1.3</td>
<td>257</td>
</tr>
<tr>
<td>Hardware Sales and Services</td>
<td>0.5</td>
<td>556</td>
</tr>
</tbody>
</table>
5.4.2 Number of Employees

It is found from the survey, that the average no of employee of the ICT companies at Jessore are 20. Number of employee with respect to type of services is shown in the following table:

Table 5.8: No of Employees

<table>
<thead>
<tr>
<th>Type of Services</th>
<th>ICT Engineering Graduates (hardware)</th>
<th>Graduates/ Diploma in Software</th>
<th>General Science Graduates</th>
<th>Other Graduates</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Development and Services</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Hardware Sales and Service</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>20</td>
</tr>
</tbody>
</table>

5.4.3 Average Salary of Professional

Average monthly salaries of professionals with 2 – 5 years of experience are shown in the following table:

Table 5.9: Average Monthly Salary of Professional

<table>
<thead>
<tr>
<th>Occupation Title/Skill level</th>
<th>Monthly Salary (Tk.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Quality Assurance; Software Engineer</td>
<td>9,200</td>
</tr>
<tr>
<td>System Administrator; Internet Programmer; Database Designer; Technical Writer; Web Site Designer; Software Quality Controller; Application; Telecommunication Engineering</td>
<td>9,000</td>
</tr>
<tr>
<td>Multimedia Specialist; Network Engineering; Web Site Developer</td>
<td>8,667</td>
</tr>
<tr>
<td>Management Employees (HR, Admin, Accounts, Marketing)</td>
<td>7,000</td>
</tr>
</tbody>
</table>

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 problem 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. Reliable internet connectivity increases the quality of services as well.

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 services. 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 carry out such tasks and with whom to involve. 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 centralized facility. Financing of such centralized 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.

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 industry in 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.
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 Standardization of Industry Sub-categories

Based on the findings and experience gathered from the survey, a standardisation 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
Table 6.1: Standardization of Sub-categories of Industries

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Suggested Number of units</th>
<th>Space Requirement (sft/tenant)</th>
<th>Number of Employees/tenant</th>
<th>Bandwidth Requirement (Mbps/tenant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Software Development and Services</td>
<td>31</td>
<td>1,500</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>2. BPO</td>
<td>6</td>
<td>1,500</td>
<td>30</td>
<td>1.5</td>
</tr>
<tr>
<td>3. Training</td>
<td>2</td>
<td>1,500</td>
<td>25</td>
<td>0.6</td>
</tr>
<tr>
<td>4. Other</td>
<td>6</td>
<td>500</td>
<td>11</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Total no of Units</strong></td>
<td><strong>45</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3 Demand Forecast Methodology

The ICT industry in Jessore is only beginning to grow. There are few software companies in Jessore; most ICT companies in Jessore supply computers or operate cyber cafes. Hence, it is not practical to directly evaluate local demand for facilities offered by the Jessore ICT Park. Because the ICT industry in Bangladesh is only beginning to develop, most ICT related firms are concentrated in Dhaka. Hence a survey on 68 ICT firms was conducted through questionnaire; this survey took place in Dhaka and Jessore.

With inputs from market survey, the demand forecast of Jessore 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.
Determine the volume of Jessore ICT Industry based on total market size of Bangladesh ICT Industry and determine the volume of Jessore ICT Village based on volume of Jessore ICT of Industry.

The ICT graduates of Jessore are approximately 660. This is slightly more than 1.5% of Bangladesh’s ICT graduates. Considering the competitive status of Jessore, the Jessore’s share of employment generation in Bangladesh’s IT/ITES industry was considered as 1% provided that the growth in Bangladesh’s IT/ITES industry was evenly spread in terms of ICT graduates (other demographic considerations such as share of working age, population, excluded). However, there are still further improvements that can be made in equipping the labor force in Jessore for large-scale operations in IT/ITES; there is a need for formal and informal apprenticeship programs to equip local youth in Jessore. There is also a need for a marketing campaign in Jessore to increase awareness about opportunities in IT/ITES to the local population.
Therefore, the volume for Jessore ICT Industry is considered as 1% of total Bangladesh ICT Industry. The volume for Jessore ICT Village is considered as 85% of total Jessore ICT Industry. Industry volume of Jessore 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 Jessore 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)

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
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 participants.
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**
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 not depended 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**

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

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)

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**

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

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**
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**

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

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 C2 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.
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**

<table>
<thead>
<tr>
<th>Category of Services</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5 yrs</td>
</tr>
<tr>
<td>1. Software Development</td>
<td>18%</td>
</tr>
<tr>
<td>2. BPO</td>
<td>3%</td>
</tr>
<tr>
<td>3. Training</td>
<td>12%</td>
</tr>
<tr>
<td>4. Others</td>
<td>0.10%</td>
</tr>
</tbody>
</table>

**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 Jessore.
2. Four different categories 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 Jessore ICT Industry is considered as 1% of Bangladesh ICT Industry.
6. Allocation of demand for Jessore ICT village is considered as 85% of Jessore ICT Industry.
7. Percentage of space requirement for different categories of businesses are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Software Development</th>
<th>BPO</th>
<th>Training</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(a)</strong></td>
<td>75%</td>
<td>15%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

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 Jessore 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 Jessore ICT village under base case, optimistic case and conservative case are attached in Annex G.
The total leasable area of ICT village is 64,200 sft. Based on the demand forecast in different scenarios, the occupancy rates in different scenarios will be assumed.

### Table 6.6: Demand Projection for Space in Different Scenarios

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
<th>Y4</th>
<th>Y5</th>
<th>Y6</th>
<th>Y7</th>
<th>Y8</th>
<th>Y9</th>
<th>Y10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Case</strong></td>
<td>33,277</td>
<td>38,001</td>
<td>43,534</td>
<td>48,798</td>
<td>54,714</td>
<td>61,363</td>
<td>68,837</td>
<td>77,240</td>
<td>85,874</td>
<td>95,563</td>
</tr>
<tr>
<td><strong>Optimistic Case</strong></td>
<td>36,928</td>
<td>43,262</td>
<td>50,839</td>
<td>58,505</td>
<td>67,343</td>
<td>77,537</td>
<td>89,296</td>
<td>102,861</td>
<td>117,470</td>
<td>134,276</td>
</tr>
<tr>
<td><strong>Conservative Case</strong></td>
<td>30,469</td>
<td>33,973</td>
<td>37,979</td>
<td>41,169</td>
<td>44,660</td>
<td>48,482</td>
<td>52,666</td>
<td>57,249</td>
<td>61,068</td>
<td>65,145</td>
</tr>
</tbody>
</table>

The above table shows that, the demand for space of 64,200 sft will be filled up within 7 years in base case, 5 years in optimistic case and 10 years in conservative case.

Overall rate of occupation within Jessore, 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 five (5) years. Given the overall demand, a seven (7) year take-up would seem to be realistic.

The survey indicates that the ICT village will be fully taken up within longest ten (10) years from start of operation in the conservative case, while it is most likely to be filled up within seven (7) years in the base case. The new occupancy rates assumed in three cases are provided in the following table:
It is assumed that balance 5% of the space will not be occupied most of the time due to changing tenants.

### 6.11 Number of Tenants

Forecasts were made for different scenarios to estimate the number of tenants in the ICT village 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 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

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Development</td>
<td>1,500</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
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<td>-</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>BPO</td>
<td>1,500</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>6</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>1,500</td>
<td>1</td>
<td>1</td>
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<td>-</td>
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<td>2</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>500</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
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<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Forecasted New Tenants</td>
<td></td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>2</td>
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<td>-</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Total Forecasted New Tenants</td>
<td></td>
<td>8</td>
<td>16</td>
<td>30</td>
<td>37</td>
<td>41</td>
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</tr>
</tbody>
</table>

Feasibility Study for Jessore Software Technology Park
The ICT village will generate significant employment for Jessore district. Some employment would not have been generated had there been no ICT village in Jessore. 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 6-6: Potential Employment Generation**

In base case, employment for 950 individuals has exceeded in 7th year of operation; in optimistic case this has been realized in 5th year; and in conservative case this has been realized in 10th year. Of the three cases considered, base case is the most likely scenario.

Considering these three scenarios, there is a demand for approximately 950 individuals in Jessore ICT village. Based on an average estimate of 70 sft per person, there is sufficient demand for 64,000 sft of office space in Jessore ICT village.

### 6.12 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 6.9: Yearly Bandwidth Requirement

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
<th>Y4</th>
<th>Y5</th>
<th>Y6</th>
<th>Y7</th>
<th>Y8</th>
<th>Y9</th>
<th>Y10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>19</td>
<td>22</td>
<td>25</td>
<td>28</td>
<td>31</td>
<td>35</td>
<td>39</td>
<td>44</td>
<td>49</td>
<td>54</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>21</td>
<td>25</td>
<td>29</td>
<td>33</td>
<td>38</td>
<td>44</td>
<td>51</td>
<td>58</td>
<td>67</td>
<td>76</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>17</td>
<td>19</td>
<td>22</td>
<td>23</td>
<td>25</td>
<td>28</td>
<td>30</td>
<td>33</td>
<td>35</td>
<td>37</td>
</tr>
</tbody>
</table>
Technical Planning and Design
7 TECHNICAL PLANNING AND DESIGN

7.1 Functional Specifications and Space Allocation

The ICT Village in Jessore is to be geared to encourage the development of Software technology industry in Bangladesh, primarily by private sector entrepreneurs. However, 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 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. Thus the Govt. provides the support, the private sector the product, in this case the development and marketing and sales of software.

Therefore, in total project space and facilities for software development takes priority. Most other spaces are there to support this activity. For the programme purposes there will be a Multi Tenant Building (MTB) in the Jessore ICT village, where majority of floor area is given to lease for private sector software development companies and entrepreneurs.

Other major buildings include Food court, Seminar and Conference facilities building. Support services like, Substation, Generators etc. and a Dormitory Building to house the people working in the main buildings are also to be provided in ICT village.

The Functional Specifications called for the following program development:

1. Multi Tenant Building (MTB)

The total area of the multi tenant building is approximately 84,000 sft. The MTB have the following spaces:

i. Software Development Area
ii. Data Recovery Centre
iii. Research & Development (R & D) Area
iv. Call Centers
v. Training Area
vi. STP Administration Area
vii. Commercial Banks
viii. Prayer Room
ix. Anchor Tenants
x. Mechanical Services Area
xi. Reception, Lobby Foyer Areas
xii. Core Service Areas (including 2 Lifts, 2 Fire stairs, 2 washrooms on each floor, wide staircase facility)
123

3. Connecting Atrium building
4. Electrical sub - station & generators
5. Dormitory / Hostel and Gymnasium
   i. 126 Bedroom or Hostel suits
   ii. Kitchen
   iii. Dining
   iv. Reception, Foyer, lounge, lobby
   v. Administration etc
   vi. Gymnasium

6. Future expansion of Software Technology Park spaces on site and across the site to north

The ICT Village will also have infrastructure such as internal road network and walkways, car parking facility, utility (fiber optic, telephone, electricity, water) networks, sewerage system, RCC storm water drain network, landscaped green areas, gardens/parks, prayer house, playgrounds etc. around the ICT Building/s with provision for future expansion.
7.2 Site Layout

A Google map of the site and surroundings is shown above. The Jessore - Khulna Road is to the north east away from the site. The site has an area of 3.03 acres approximately. It is approachable by means of a side road from the main Jessore – Khulna Road approximately 1.0 km North East of the site. The site itself is has roads to the north and the west sides. Located to the west and north-west are the Regional passport office and the building of the Technical Training Centre. Also to the north-west inside the road and adjacent to the site is the Public Library. To the south side is six-storey apartment building. To the east side are some metal roofed storage types building. Across the road on the north side is a large water body (“Dighi” in Bangla). There are no other major structures on or around the site.

The site itself is a depression with water collecting to the south side on the site itself. Thus, the site will need considerable filling and compaction to bring it up to the level of desired grade for construction.

On other major drawback of the site is that the site is at the end of a road. The other road that goes past on the west side becomes very narrow and not for vehicular navigation without major expansion. The access road is thus like a Cul-de-sac with no scope for traffic egress. This could pose a problem in future for access of fire Fighting trucks and other emergency vehicles.
7.3 Master Planning

For the proposed ICT Village at Jessore two master plans were prepared by two different consulting firms. These are as follows:

i. **Master Plan Option A** (prepared by Urban Habitat Consultant)

ii. **Master Plan Option B** (prepared by Bangladesh Consultant Ltd.)

All Master Plan Options for the proposed ICT village are presented as Annex I.

Two different master planning options were explored with the given functional programs to accommodate:

A. A MTB (Multi Tenant Building, primarily for Software development) with Conference / seminar / sales and food Courts etc and an area of 110,000 sq. ft building

B. Future Expansion of the Software development possibilities

C. Data Centre

D. A Dormitory / Hostel and a Gymnasium Building with about 120 -140 bedroom and related facilities etc.

E. Ancillary Building with Substations, Generators, and miscellaneous storage space etc

F. Recreational spaces

G. Adequate parking (as per code) on site

7.4 ICT Buildings and Civil Structures

ICT Village in Jessore 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 ICT Village in Jessore thus should be a forward looking and future technology buildings. The functions and images should reflect this.

The main buildings of STP Jessore will be structural steel structures. The columns and beams will be of prefabricated structural steels. This will aid in quick erection and implantation of the building. In fact the erection of the steel structure can be made in a matter of four to six months as against fifteen to eighteen months for a RCC (Reinforced Cement Concrete) structures.

7.5 Designs and Floor Plans

**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 (Retail Sales, Conferences, Seminars, Food facilities) etc. is proposed to be designed as a Smart Building with steel 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 tranquillity, good environment, and use of fewer areas on site as possible and for future expansion.

The soil conditions on the site is weak and the recommendations for building using piles suggest a 6 storied RCC structure or steel building up to 7 floors. Thus, building structures like 10+ storied building could be problematic and requiring alternate types from pure pile foundation system. Thus this decision should be taken carefully by the project engineers, considering all soil and foundation issues. The soil test report of the site is attached as Annex J.

Some Design salient features are mentioned below:

**Structural Steel Building:** Both the MTB Building (Block A) and the Facilities Building (Block B) as well the connecting Atrium Building (Block C) has been designed with Structural Steel Frame and flooring system. This means that the whole building frame and structure is built with structural columns and beams. The floors are made of metal deck on open web steel joists (OWSJ). This topped with 3’ of poured concrete deck with a wire mesh system. Under this system, the erection of the building, particularly the building structural can be done in less than a third of the time as it takes for conventional RCC structure building.

**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 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 are designed with a RCC core. Secondly, it has 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 provisions for cooling ducts and electrical and power services. The ceilings should be equipped sprinkler systems for localized fire suppression, before it will have opportunity for fire 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, is a designated space for mechanical equipments including compressors for cooling of each floor. Instead of a centralized cooling system with cooling towers and chilling system, the system proposed is one with a localized A/C.

### 7.6 On-Site Infrastructure

On-Site infrastructure includes Roads, Power, Water Supply, Sewerage treatment, and other infrastructure and utility services and facilities as fibre optics etc.
Cost Estimates
# COST ESTIMATES

## 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 such items as Road surfacing, Foundation or architectural elements and finishes are assumed. Then that assumed 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 numbers the grand total 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.

## Site Development and On Site Infrastructure Construction Cost

The site development and on site infrastructure cost under two different master plans are shown below:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
<th>Sub-Total Cost (Tk million)</th>
<th>Total Cost (Tk million)</th>
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<tbody>
<tr>
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<td>8.00</td>
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<td>2.</td>
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<td>3.</td>
<td>Pavements</td>
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<td>0.56</td>
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<tr>
<td>4.</td>
<td>Parking</td>
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<tr>
<td>5.</td>
<td>Concourse</td>
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<td>sft</td>
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<td>3.50</td>
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<td>6.</td>
<td>Landscaping</td>
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<td>sft</td>
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<td>7.</td>
<td>Boundary wall</td>
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**Total Cost for Site and Land Development**

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<th>Option A</th>
<th>Option B</th>
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<tbody>
<tr>
<td>32.62</td>
<td>28.88</td>
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</tbody>
</table>

## ICT Buildings and Civil Construction Costs

The ICT building and civil construction costs of two different master plans are shown below:
### Chapter 8: Cost Estimates

#### Feasibility Study for Jessore Software Technology Park

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
<th>Sub-Total Cost (Tk million)</th>
<th>Total Cost (Tk million)</th>
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<tr>
<td>B</td>
<td>Multi Tenant Building</td>
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<td>140,000</td>
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<td>1.</td>
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<td>ft</td>
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<td>2.</td>
<td>Steel Super Structure</td>
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<td>ft</td>
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<td>800</td>
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<td>3.</td>
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<td>Architectural Elements</td>
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<td>Mechanical</td>
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<td>6.</td>
<td>Electrical System and Lighting</td>
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<td>7.</td>
<td>Fire Fighting system</td>
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<td>250</td>
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<td>8.</td>
<td>Sanitary and Plumbing Facilities</td>
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<td>110</td>
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<tr>
<td>9.</td>
<td>Parking</td>
<td>14,000</td>
<td>2,970</td>
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<td>800</td>
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<td><strong>Sub Total Cost</strong></td>
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<td></td>
<td></td>
<td></td>
<td>216</td>
<td>413</td>
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</table>

<p>| C     | Facilities Building /Canteen Building | 24,000       | 2,970 | ft                 | 600.00 | 600 | 4 | 1.78 |
| 1     | Foundation            | 6000         | 2,970 | ft                 | 600.00 | 600 | 4 | 1.78 |
| 2     | Steel Super Structure| 24000        | 2,970 | ft                 | 800.00 | 800 | 19 | 2.38 |
| 3     | RCC Core and other structural Elements | 2400         | ft     | 800.00 | 2 | - |</p>
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<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
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<td>Architectural Elements</td>
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<td>2,970</td>
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<td></td>
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<td>800.00</td>
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<td>Mechanical Cooling Ventilation and Air Change</td>
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<td>500</td>
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<td>1.49</td>
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<td>Sanitary and Plumbing Facilities</td>
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<td>110</td>
<td>3</td>
<td>0.33</td>
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<td>Electrical Fittings and Fixtures</td>
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<td>8</td>
<td>Fire Fighting</td>
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<td>0.74</td>
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<td>D</td>
<td>Atrium Building /Data Recovery Building</td>
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<td>800</td>
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<td>4</td>
<td>Mechanical Cooling Ventilation and Air Change</td>
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## Chapter 8: Cost Estimates

### Feasibility Study for Jessore Software Technology Park

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<tr>
<th>Sl No</th>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
<th>Sub-Total Cost (Tk million)</th>
<th>Total Cost (Tk million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option A</td>
<td>Option B</td>
<td>Option A</td>
<td>Option B</td>
</tr>
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<td>1</td>
<td>Foundation</td>
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<td>800</td>
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<td>2</td>
<td>RCC and brick masonry structure</td>
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<td>26,760</td>
<td>sft</td>
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<td>3</td>
<td>RCC Core and other structural Elements</td>
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<td>1,000</td>
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<td>Mechanical</td>
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<td>Electrical System and Lighting</td>
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<td>26,760</td>
<td>sft</td>
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<td>sft</td>
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<td>Other miscellaneous costs</td>
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<td><strong>Sub Total Cost</strong></td>
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### F Common Facilities

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<th>10.00</th>
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<tbody>
<tr>
<td>Electrical Sub-station/ Transformer (1000 kva)</td>
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<td></td>
<td>7,500,000</td>
<td>7,500,000</td>
<td>15</td>
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<td></td>
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<tr>
<td>Sewerage</td>
<td>lump</td>
<td>lump</td>
<td>5,000,000</td>
<td>5,000,000</td>
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### System Design

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<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
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<tbody>
<tr>
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<td>System sum</td>
<td>sum</td>
<td>sum</td>
<td>000</td>
<td>000</td>
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<table>
<thead>
<tr>
<th>Deep Well</th>
<th>Tube</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
<th>Sub-Total Cost (Tk million)</th>
<th>Total Cost (Tk million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>unit</td>
<td>3,500,000</td>
<td>4</td>
<td>3.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fiber Optics</th>
<th>Unit</th>
<th>Unit Cost (Tk/unit)</th>
<th>Sub-Total Cost (Tk million)</th>
<th>Total Cost (Tk million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sum</td>
<td>2,500,000</td>
<td>3</td>
<td>2.50</td>
</tr>
</tbody>
</table>

**Sub Total Cost**

<table>
<thead>
<tr>
<th></th>
<th>Option A</th>
<th>Option B</th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36</td>
<td>36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Cost for ICT Building and Civil Construction**

<table>
<thead>
<tr>
<th></th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>452</td>
<td>573</td>
</tr>
</tbody>
</table>

### Total Construction Costs

Total project construction cost under the two different master plans are shown below:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>Area /volume</th>
<th>Unit</th>
<th>Total Cost (Tk million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A    | Site and Development          | 3.03 acre    | 3.03 | 33                      |
| B    | Multi Tenant Building         | 84,000 sft   | 140,000 sft | 216       |
| C    | Facilities Building /Canteen Building | 24,000 sft | 2,970 sft | 66          |
| D    | Atrium Building /Data Recovery Building | 1,400 sft | 4,500 sft | 5           |
| E    | Dormitory Building            | 55,800 sft   | 26,760 sft | 130         |
| F    | Common Facilities             |              |      |                         |
|      | Total Project Construction Cost |          |      |                         |

**Total Project Construction Cost**

<table>
<thead>
<tr>
<th></th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>484</td>
<td>602</td>
</tr>
</tbody>
</table>

### Identification Of O&M Cost

O & M Costs should include the following components:

1. Site Maintenance costs
2. Roads and Parking areas maintenance cost
3. Site Utility Services Costs (water supply, sewerage)
4. ICT Building Maintenance cost  
   a. Utility Services Costs  
   b. Power costs  
   c. A/C & Power costs  
   d. Gas  
   e. Cleaning, Maintenance and repairs cost  
   f. Service Manpower costs  

5. Dormitory Building / Gymnasium  
   a. Utility Services costs  
   b. Power costs  
   c. A/C & Power costs  
   d. Gas  
   e. Cleaning, Maintenance and repairs cost  
   f. Service Manpower costs  

6. Annual Maintenance and Repairs Costs  

7. Five year overhauling and maintenance and repairs cost
9

Investment Models
9 INVESTMENT MODELS

The ICT Village may be financed through government fund or Public Private Partnership.

9.1 Government Funding

9.1.1 Bangladesh Government’s Own Fund

It is essential to carry on the activities from own resources, before achieving success in realizing external funds. It will help to convince the donor agencies for providing funds and expedite the activities.

9.1.2 Donor Funds

Donors are found to be usually highly interested in funding ICT village in Bangladesh. The World Bank has already shown significant interest. However, donors always require the government to put up the funds from its own sources first.

A separate project has been created by the Government and DPP has been approved.

9.2 Public Private Partnership

Public-Private participation refers to the deals where a Government Executing Agency provides a right to a private 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.

Development of ICT village through PPP may occur for the entire village or for PPP for O&M of entire village.

9.3 Implementation Options for the ICT Village

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.

9.3.1 Option I: Government Led Model

In this model, BHTPA will be responsible for off-site development, land development, on-site development, financing and O&M of the village. BHTPA will request government to acquire the land with own fund, donor fund or from government budget allocation. After financing is secured, land development will be undertaken by BHTPA. BHTPA will also develop on-site infrastructure such as roads, electricity connections, sewerage etc.
After completion of construction of village, BHTPA will lease out plots to tenants and receive lease payments in return. BHTPA will also be responsible for O&M of the village. The overall structure is presented in Figure 9.1.

**Figure 9-1: Option I: 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.
9.3.2 Option II: O&M Outsourcing Model

A government owned ICT village, after being developed with the on-site and off-site infrastructure, may chose to award the operation and management activities to a private sector entity for achieving better efficiencies in service delivery to the village units. Such arrangements can be termed as “PPP for O&M of Entire Village.”

In this model, land development, on-site development, financing and construction of the village will be carried out by BHTPA. A private operator will be responsible for O&M of the village. This model is a PPP for O&M of the village as mentioned in Section 9.2.2 of the report.

BHTPA will request government to acquire the land with own fund, donor fund or from government budget allocation. After financing is secured, land development will be undertaken by BHTPA. BHTPA will also develop on-site infrastructure such as roads, electricity connections, sewerage etc. In parallel, BHTPA will invite tender from potential private developers to operate and maintain the village.

The private operator, after being selected and awarded the project, obtains a lease over the land for the concession period, through a Concession Agreement and a lease agreement 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 II: O&M Outsourcing Model
The advantages of this model are as follows:

- Private sector efficiency is achieved but only for the operation and management of the ICT Village
- 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 village.
- No clear source of government funding for making such a substantial investment has been identified yet.

### 9.3.3 Option III: Concession PPP Model (BOT)

PPP is the partnership where the public sector agency, after upfront development of the village and then provides the responsibility of downstream development and operation to private sector. The scope of upfront development and downstream development and operation is discussed below.

#### i. Upfront Development

Upfront development may be defined as preparatory activities like project identification and preparation, land development, preparation and development of interior master plan etc.

#### ii. Downstream Development and Operation

After the upfront development, private operators will be invited to conduct downstream development and operation of the village. Downstream development and operation includes internal village developments, as well as delineating and standardizing space for the tenants. In operations, the village developer is to operate and maintain the ICT village, by attracting tenants to set up their business within the village.

#### iii. Delineation of Responsibilities in Entire Village PPP

The share of responsibilities between the public and private sector in an entire village PPP are usually delineated along the lines provided in the following table:

<table>
<thead>
<tr>
<th>Public Sector</th>
<th>Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Developing the Master Plan of the village</td>
<td>a) Land development</td>
</tr>
<tr>
<td>b) Guideline for developing the village</td>
<td>b) Developing space as per the Master Plan and the guidelines provided by Government</td>
</tr>
</tbody>
</table>
### Public Sector
- c) Defining terms and conditions defining the interrelationship between private and the public sector
- d) Preparation of information memorandum on the village and the market
- e) Development of off-site infrastructure
- f) Environmental clearance of the village from DOE and from donors (if required)
- g) Regulation of the village activities
- h) Receiving license for developing the village

### Private Sector
- c) Authority
- d) Marketing to the potential entrepreneurs for setting units in the villages
- e) Environmental and social impact mitigation
- f) Reporting to the appropriate authority
- g) Payment of royalties and license fees to the government, if any

In this model, land development will be carried out by private developers. The private operator will be responsible for on-site development and O&M of the village. Financing for both land and on-site development will be handled by the operator. On-site development in this case refers to the construction and development of the core business facility, the Multi-Tenant Building. The construction of non-core business building with low investment returns like the dormitory will be undertaken by the government.

Under this approach, the government will only be responsible for land acquisition and off-site development. BHTPA will request government to acquire the land with own fund, donor fund or from government budget allocation. From this point forward, private operators will assume all responsibility including financing and land/on-site development as well as long term O&M.

The private operator obtains a lease over the land for the concession period, through a Concession Agreement and a lease agreement 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 after development of on-site infrastructure such as roads, electricity connections, sewerage etc.

The tenants will pay lease rentals to the operator. After completion of the Concession period, the private operator will hand over O&M of the village to BHTPA. The overall structure is presented in Figure 9-3.
The advantages of this model are as follows:

- Private sector efficiency in operating and maintaining the village is achieved.
- Government needs substantially less investment in village compared to Option I and Option II as investment is shared by the private operator.
- Government has strong control through Concession Agreement on regulation of the village.

The disadvantages of this model are as follows:

- No clear source of government funding for making investment in the village has been identified yet.
- Private operator 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.

### 9.3.4 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 the village:
Table 9.2: Comparison of Options

<table>
<thead>
<tr>
<th></th>
<th>Option I: Government Model</th>
<th>Option II: O&amp;M Outsourcing Model</th>
<th>Option III: Concession PPP Model (BOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>BHTPA</td>
</tr>
<tr>
<td>Off-site Development</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>BHTPA</td>
</tr>
<tr>
<td>Land Development</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>Private Investor</td>
</tr>
<tr>
<td>Overall Layout (Preliminary)</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>BHTPA</td>
</tr>
<tr>
<td>Overall Layout (Final)</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>Private Investor</td>
</tr>
<tr>
<td>Financing and Construction</td>
<td>BHTPA</td>
<td>BHTPA</td>
<td>Private Investor</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>BHTPA</td>
<td>Private Operator</td>
<td>Private Investor</td>
</tr>
</tbody>
</table>

The O & M contractor selection process and criteria will be described in detail in the next chapter.
O&M Contactor Selection Process And Criteria
Engaging a private operator is typically a step-by-step process. The steps involved are described in the following paragraphs:

### 10.1 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.

### 10.2 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.

### 10.3 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**
10.4 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 10-1: Private Operator Selection Process**

10.5 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.

10.6 O&M Contractor Selection Criteria

The offer for participating in the project will be open to all eligible private operators\(^1\) from all countries which Bangladesh has diplomatic relationship.

---

\(^1\) 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:

### 10.7 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.

### 10.8 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 private 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.
10.9 Part I Evaluation: Technical Responsiveness Test

10.9.1 Legal Status

The participant must be a legal entity with all documentary evidence\(^2\) 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.

10.9.2 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.

10.9.3 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.

10.9.4 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.

10.10 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

\(^2\) 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

10.11 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.
11

Financial Analysis
11 FINANCIAL ANALYSIS

This section presents the assumptions and results of the financial analysis of the Development of a ICT Village at Jessore conducted by the Consultant as part of the Feasibility Study. The financial analysis is conducted from the perspective of the Government, with Bangladesh Hi-Tech Park Authority (BHTPA) providing funding for the construction of the ICT Village.

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.

11.1 Introduction

The objective of the Jessore ICT Village is to establish knowledge based industries in Jessore, 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 3.03 acres of land at Barandi Mouza, Jessore to establish the ICT Village. The ICT Village is proposed to consist of Multi-Tenant Buildings (MTBs) which will accommodate ICT industry companies 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 commercialize academic researches and strengthen local university association with the ICT Village

In addition to office space for ICT firms, the ICT Village will have a range of ancillary facilities such as cafeteria, data center, banks, gymnasiums, conference hall, dormitory 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 model – presented in Chapter 9

Estimations of operational costs, cost escalations and financing structure have been made for the financial analysis.

11.2 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. Figure 11-1.
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 on 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.
11.3 Structure of the Financial Model

The financial analysis for the project was conducted using a spreadsheet-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 11-2.

Figure 11-2: 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:

<table>
<thead>
<tr>
<th>Input Sheets</th>
<th>1) Project Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2) Cost Estimate</td>
</tr>
<tr>
<td></td>
<td>3) Demand Forecast</td>
</tr>
<tr>
<td>Processing Sheets</td>
<td>4) Debt Servicing</td>
</tr>
<tr>
<td></td>
<td>5) Projected Revenue</td>
</tr>
<tr>
<td></td>
<td>6) Depreciation</td>
</tr>
<tr>
<td></td>
<td>7) Projected O&amp;M Costs</td>
</tr>
<tr>
<td></td>
<td>8) Asset Schedule</td>
</tr>
<tr>
<td>Result Sheets</td>
<td>9) Income Statement</td>
</tr>
<tr>
<td></td>
<td>10) Cash Flow</td>
</tr>
<tr>
<td></td>
<td>11) Sensitivity Analysis</td>
</tr>
</tbody>
</table>
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.

### 11.3.1 Input and Input Support Sheets

The input sheets include (1) project parameters sheet (2) project cost sheet, and (3) demand forecast sheet (Figure 11-3).

**Project Parameters Sheet**

This sheet contains all the major parameters of the project which 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, and interest during construction (IDC) etc.

This worksheet provides a summary of the project costs for the ICT Village development 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 take-up 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.
11.3.2 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
4. O&M Costs
5. 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 Private Investor from sources such as:

a. Rent from ICT units
b. Rent from cafeteria
c. Rent from Data Center
d. Rent from banks
e. Rent from Conference Center
f. Service charge from building 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 Private 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.

11.3.3 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 for 30 years. 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.

11.3.4 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.

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.

### 11.4 Base Case 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 Government Led Investment Model. Under this model, BHTPA will be responsible for land development, on-site development, financing, regulation and O&M of the ICT Village. BHTPA will request government to acquire the land with own fund, donor fund or from government budget allocation. After financing is secured, land development will be undertaken by BHTPA. BHTPA will also develop on-site infrastructure such as roads, electricity connections, sewerage etc.  

After completion of construction of the ICT Village, BHTPA will lease out plots to tenants and receive lease payments in return. BHTPA will also be responsible for regulation and O&M of the village (Figure 11-6).
In addition to the core business of leasing out office space, BHTPA will also earn revenue from the following commercial facilities in the ICT Village:

- Banks
- Cafeteria
- Data Center
- Conference Center

In addition to the commercial facilities, the following facilities will also be present in the ICT Village:

- Administration office of ICT Village
- Research (R&D) area
- Dormitory
- Gymnasium
- Prayer room
- Meeting rooms

Operator of the ICT Village will also be responsible for maintenance of the Park including security. Operator will collect a monthly O&M charge from the tenants to this end, in addition to the lease charges.

11.5 Model Scenarios

11.5.1 Demand Scenarios

The model has been used to assess the viability of developing the ICT Village using three different demand forecast scenarios.

The three different scenarios analyzed are as follows:

**Base Case:** In the base case scenario, it is estimated that it will take 7 years from commercial operations for all the available leasable area in the ICT Village to be taken up by tenants.
Optimistic Case:  In the optimistic case scenario, it is estimated that it will take 5 years from commercial operations for all the available leasable area in the ICT Village to be taken up by tenants.

Conservative Case:  In the conservative case scenario, it is estimated that it will take 10 years from commercial operation for all the available leasable area in the ICT Village 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.

11.5.2 Layout Options

Financial analysis has been carried out using two proposed master plan layout options of the ICT Village. The two layout options are:

- Urban Habitat Layout (layout prepared by Consultant’s associate firm)
- BCL Associates Layout (layout prepared by BHTPA’s consultant)

11.5.3 Base Case

The base case scenario for the development of the ICT Village was assumed to be under the following parameters:

- Urban Habitat Layout
- Base Case Demand Forecast (space uptake in 7 years)

Other options have been analyzed as different scenarios of the model.

11.6 Key Model Parameters

Key parameters for the base case scenario are presented in Table 11.1 and discussed in more detail in this chapter.
### Table 11.1: Overview of Key Parameters in Base Case

<table>
<thead>
<tr>
<th>Category</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment Model</strong></td>
<td>Government Led Model</td>
</tr>
<tr>
<td><strong>Period Analyzed</strong></td>
<td>30 years from start of construction</td>
</tr>
<tr>
<td><strong>Construction Start</strong></td>
<td>2014 (January)</td>
</tr>
<tr>
<td><strong>Construction Completion</strong></td>
<td>2016 (December)</td>
</tr>
<tr>
<td><strong>Commercial Operation Date</strong></td>
<td>2017 (January)</td>
</tr>
<tr>
<td><strong>Land Area</strong></td>
<td>3.03 acres</td>
</tr>
<tr>
<td><strong>Leasable Area</strong></td>
<td></td>
</tr>
<tr>
<td>Core Business</td>
<td>64,200 sft</td>
</tr>
<tr>
<td>Non Core Business</td>
<td>23,700 sft</td>
</tr>
<tr>
<td><strong>Number of ICT Units at the Village</strong></td>
<td>45</td>
</tr>
<tr>
<td><strong>Type of ICT units to be located at the ICT Village</strong></td>
<td>Software Development and Services</td>
</tr>
<tr>
<td></td>
<td>Business Process Outsourcing</td>
</tr>
<tr>
<td></td>
<td>Training Center</td>
</tr>
<tr>
<td></td>
<td>Other ICT services</td>
</tr>
<tr>
<td><strong>Size of office spaces for lease</strong></td>
<td>500 sft and 1,500 sft</td>
</tr>
<tr>
<td><strong>Lease Rates</strong></td>
<td></td>
</tr>
<tr>
<td>ICT Office Space, BPO offices and Training Centres</td>
<td>Tk 40 /sft/mon</td>
</tr>
<tr>
<td>Data Center, Cafeteria, Bank,</td>
<td>Tk 50 /sft/mon</td>
</tr>
<tr>
<td>Conference Hall</td>
<td>Tk 20,000 / day</td>
</tr>
<tr>
<td><strong>Lease Rate Escalation</strong></td>
<td>12% per year</td>
</tr>
<tr>
<td><strong>O&amp;M Service Charge</strong></td>
<td>Tk 2.50 /sft/month</td>
</tr>
<tr>
<td><strong>Debt/ Equity Ratio</strong></td>
<td>60% (60% Government Loan, 40% Equity)</td>
</tr>
<tr>
<td><strong>Loan Term</strong></td>
<td>20 years</td>
</tr>
<tr>
<td><strong>Grace Period for Loan Repayment</strong></td>
<td>5 years</td>
</tr>
<tr>
<td><strong>Interest Rate</strong></td>
<td>13.70%</td>
</tr>
</tbody>
</table>
11.6.1 Business Period

Financial analysis of the development of the ICT Village has been carried out for a period of 30 years from start of construction of the Park.

11.6.2 Project Timeline Estimates

Estimates in the model with regards to the timeline of implementation of the project is given in Table 11.2.

<table>
<thead>
<tr>
<th>Project Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
</tr>
<tr>
<td>Construction Period</td>
</tr>
<tr>
<td>Construction Start</td>
</tr>
<tr>
<td>Commercial Operations</td>
</tr>
</tbody>
</table>

Table 11.2: Project Timeline Estimates

In the base case model, BHTPA will be financing and developing the project. As such, it is estimated that the construction of the ICT Village may be started by early 2014. A construction period of 3 years has been assumed. Commercial operation of the ICT Village is expected to be from early 2017 (Figure 11-7).

Figure 11-7: Project Timeline
11.6.3 Land Allocation

Assumptions made in regards to allocation of land in the ICT Village are shown in Table 11.3. In addition to the Multi Tenant Buildings and dormitory, the ICT Village will also have provisions for internal roads, pavements, parking area, concourse and green space.

Table 11.3: Land Allocation

<table>
<thead>
<tr>
<th>Land</th>
<th>Urban Habitat Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
</tr>
<tr>
<td>Total Land Area</td>
<td>3.03</td>
</tr>
<tr>
<td>ICT Buildings Area(^1)</td>
<td>50%</td>
</tr>
<tr>
<td>Land required for</td>
<td></td>
</tr>
<tr>
<td>Internal Roads</td>
<td>16%</td>
</tr>
<tr>
<td>Pavements</td>
<td>1%</td>
</tr>
<tr>
<td>Parking(^2)</td>
<td>0%</td>
</tr>
<tr>
<td>Concourse</td>
<td>11%</td>
</tr>
<tr>
<td>Green Space</td>
<td>23%</td>
</tr>
</tbody>
</table>

Land allocation for the Urban Habitat layout is shown above.

In the base case layout (Urban Habitat layout), 50% of the total land is allocated for buildings including the Multi Tenant Building (MTB), dormitory, facilities building etc., 16% is allocated for internal roads, 11% for concourse and approximately 23% is greenery and water bodies. Breakdown of land for different uses is shown in Figure 11-8.
11.6.4 Cost Escalation Estimates

Yearly cost escalation values for all items are also shown in Table 11.4.

Table 11.4: Cost Escalation Estimates

<table>
<thead>
<tr>
<th>Escalation Factors</th>
<th>12%</th>
<th>per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease Rate Escalation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Cost Escalation</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>O&amp;M Cost Escalation</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Salary Escalation</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

Capital cost escalations have been estimated based on raw material cost increases in the last 10 years. Salary cost escalation have 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.

11.7 Source of Finance

The debt component is expected to be funded by Government loan in Bangladeshi Taka. According to guidelines published by Ministry of Finance on 2004 (reference no. om/obi/u:-1/bibidho-13/04/368), Government will be able to provide 60% loan on capital cost of urban development projects at a 20 year term and 5 year grace period. Development of an ICT Village in Jessore may be classified as an urban development project and as such financing structure has been developed similarly in the model. The assumed financing structure is shown in Table 11.5.

Table 11.5: Loan Assumptions

<table>
<thead>
<tr>
<th>Financial Assumptions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt</td>
<td>60%</td>
</tr>
<tr>
<td>Equity</td>
<td>40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Loan*</td>
<td></td>
</tr>
<tr>
<td>Share of loan</td>
<td>100%</td>
</tr>
<tr>
<td>Loan term</td>
<td>20</td>
</tr>
<tr>
<td>Grace period</td>
<td>5</td>
</tr>
<tr>
<td>Interest Rate**</td>
<td>13.70%</td>
</tr>
</tbody>
</table>

The interest rate on the loan has been based on Investment Promotion and Financing Facility (IPFF) lending rates, which is the specialized funding mechanism for long term infrastructure funding projects. IPFF guidelines
stipulate a lending rate of the summation of Government T-Bill rate, 30 basis points and margin of PFI. One year government T-Bill rate is currently 10.4% and margin of PFI has been assumed to be 3%. Interest rate on the loan is therefore estimated to be: \(10.4\% + 0.3\% + 3.0\% = 13.70\%\)

### 11.7.1 Corporate Tax Rate

Operator 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 (Anucched 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.

### 11.8 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.

#### 11.8.1 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.

#### 11.8.2 Normal Depreciation

The Income Tax Ordinance 1984\(^3\), prescribes the following depreciation schedule. The following table provides the prescribed rates for normal depreciation.

---

\(^3\) Third Schedule, revised in 1998
Table 11.6: Depreciation Schedule

<table>
<thead>
<tr>
<th>Types of Assets</th>
<th>Depreciable amount as Percentage of written down value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building (general)</td>
<td>10%</td>
</tr>
<tr>
<td>Factory building</td>
<td>20%</td>
</tr>
<tr>
<td>Furniture and fixture</td>
<td>10%</td>
</tr>
<tr>
<td>Machinery and plant (general rate)</td>
<td>20%</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Depreciation Rates(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building and Civil Construction</td>
</tr>
<tr>
<td>Machinery and Equipment</td>
</tr>
</tbody>
</table>

In the depreciation schedule, the above depreciable assets have been considered for tax purpose.

11.9 Demand Forecast

Demand Forecast in different scenarios has been covered in detail in Chapter 6. Table 11.7 illustrates the demand forecasts used in the model.

Table 11.7: Demand Forecast Scenarios

It is estimated that a total of 45 ICT units can be accommodated in the ICT Village. It will take 7 years for all leasable space in the ICT Village to be filled by ICT units in the base case. In the optimistic and conservative scenarios, it

\(^4\) Normal depreciation rates as per Income Tax Ordinance 1984, Third Schedule, revised in 1998
will take 5 years and 10 years respectively. Number of tenants in the ICT Village for the different scenarios is shown in Figure 11-9.

**Figure 11-9: Number of Tenants in Different Scenarios**

Demand forecast has indicated that four major types of ICT units will be located in the ICT Village. 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 ICT Village in the base case scenario is shown in Figure 11-10.

**Figure 11-10: Number of Units by Type in the Base Case Scenario**
Breakdown of ICT units, by services, in the ICT Village in the base case scenario is shown in Table 11.8. Demand forecast indicates that Software Development and Services ICT units, BPO units and Training centres will require 1,500 sft of office space each and other ICT units will require 500 sft spaces.

Table 11.8: Breakdown of ICT units by Type in Base Case scenario

<table>
<thead>
<tr>
<th>Sector</th>
<th>Office Size Requirements (sft)</th>
<th>No. of units</th>
<th>Number of 500 sft offices</th>
<th>Number of 1000 sft offices</th>
<th>Number of 1,500 sft offices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Development and Services</td>
<td>1,500</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>Business Process Outsourcing</td>
<td>1,500</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Training Center</td>
<td>1,500</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>500</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td>6</td>
<td>39</td>
</tr>
</tbody>
</table>

Figure 11-11: Office Space takeup by Type

In addition to the office space demand, commercial facilities will also be commercially leased out after commercial operations. Shows the space allocation for both core business and non-core businesses in the ICT Village. Core business demand is projected as above. It is estimated that non-core business spaces will be taken up before commercial operations of the ICT Village.
### Table 11.9: Space allocation in MTBs

**Buildings (UH Layout)**

#### Block A - Multi Tenant Building

| No. of Floors | 7 |
| Area per floor | 12,000 sft |
| Total Area | 84,000 " |

#### Software Development area

48,000 sft

#### BPO offices (call centers)

6,000 "

#### Anchor Tenants

3,200 "

#### Training Center

3,000 "

#### Data Center

6,000 "

#### Research (R&D) area

3,000 "

#### Banks

9,600 "

#### Prayer Rooms

1,000 "

#### STP Administration Offices

2,000 "

#### Leasable area

| Core Business |
| 60,200 sft |

| Non-Core Business |
| 15,600 " |

75,800 "

#### Block B - Facilities Building

| No. of Floors | 4 |
| Area per floor | 6,000 sft |
| Other | 1,000 " |
| Total Area | 28,000 " |

| Retail Sales Area |
| 4,000 sft |

| Food Court |
| 3,600 " |

| Meeting Rooms |
| 4,500 " |

| Seminar/Conference |
| 4,500 |

| Leasable Area |
| sft |

| Core Business |
| 4,000 |

| Non-Core Business |
| 8,100 " |

12,100 "

#### Block C - Atrium Building

| No. of Floors | 3 |
| Total Area | 1,400 sft |

#### Block D - Dormitory and Gymnasium Building

| No. of Floors | 9 |
| Area per floor | 6,200 sft |
| Total Area | 55,800 " |
11.10 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 in the base case. All cost estimates are in 2013 values.

Table 11.10: Hard Cost Estimate for Construction (UH Layout)

<table>
<thead>
<tr>
<th>Hard Cost</th>
<th>Total Cost (m Tk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Site and Land Development</td>
<td></td>
</tr>
<tr>
<td>Subtotal Site and Land Development</td>
<td>32.62</td>
</tr>
<tr>
<td>B Block A - Multi Tenant Building</td>
<td></td>
</tr>
<tr>
<td>Sub-total Block A (mil Tk)</td>
<td>215.54</td>
</tr>
<tr>
<td>C Block B - Facilities Building</td>
<td></td>
</tr>
<tr>
<td>Sub-total Block B (mil Tk)</td>
<td>65.76</td>
</tr>
<tr>
<td>D Block C - Atrium Building</td>
<td></td>
</tr>
<tr>
<td>Sub-total Block C (mil Tk)</td>
<td>4.55</td>
</tr>
<tr>
<td>E Block D - Dormitory and Gymnasium Building</td>
<td></td>
</tr>
<tr>
<td>Sub-total Block D (mil Tk)</td>
<td>129.95</td>
</tr>
<tr>
<td>F Common Facilities</td>
<td></td>
</tr>
<tr>
<td>Sub-total Common Facilities (mil Tk)</td>
<td>36.00</td>
</tr>
<tr>
<td><strong>Total Hard Cost</strong></td>
<td><strong>mil Tk</strong> 484.42</td>
</tr>
</tbody>
</table>

Table 11.11: Soft Cost Estimate for Construction (UH Layout)

<table>
<thead>
<tr>
<th>Soft Cost</th>
<th>m Tk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Expenses</td>
<td>5.0% 24.22</td>
</tr>
<tr>
<td>Initial Working Capital</td>
<td>45.00</td>
</tr>
<tr>
<td>Project Management</td>
<td>4.5% 21.80</td>
</tr>
<tr>
<td>Interest during Construction</td>
<td></td>
</tr>
<tr>
<td>Total Soft Cost</td>
<td>265.26</td>
</tr>
</tbody>
</table>

Table 11.12: Total Capital Cost Estimate for Construction (UH Layout)

<table>
<thead>
<tr>
<th>Total Capital Cost</th>
<th>m Tk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Cost</td>
<td>484.42</td>
</tr>
<tr>
<td>Soft Cost</td>
<td>265.26</td>
</tr>
<tr>
<td><strong>Total Capital Cost</strong></td>
<td><strong>m Tk 749.67</strong></td>
</tr>
</tbody>
</table>
Total capital cost is estimated to be Tk 749.67 million (2013 Tk) in the Urban Habitat prepared layout.

Cost estimate for the BCL Layout is given in the following tables:

**Table 11.13: Hard Cost Estimate for Construction (BCL Layout)**

<table>
<thead>
<tr>
<th>Hard Costs (BCL)</th>
<th>Area/ Volume</th>
<th>Total Cost (m Tk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Site and Land Development</td>
<td>3.03</td>
<td>28.88</td>
</tr>
<tr>
<td>B Multi-Tenant Building</td>
<td></td>
<td>412.60</td>
</tr>
<tr>
<td>C Canteen Building</td>
<td></td>
<td>9.83</td>
</tr>
<tr>
<td>D Data Recovery Building</td>
<td></td>
<td>14.63</td>
</tr>
<tr>
<td>E Dormitory Building</td>
<td></td>
<td>100.31</td>
</tr>
<tr>
<td>F Common Facilities</td>
<td></td>
<td>36.00</td>
</tr>
<tr>
<td><strong>Total Hard Cost</strong></td>
<td><strong>mil Tk</strong></td>
<td><strong>602.24</strong></td>
</tr>
</tbody>
</table>

**Table 11.14: Soft Cost Estimate for Construction (BCL Layout)**

<table>
<thead>
<tr>
<th>Soft Cost</th>
<th>m Tk</th>
</tr>
</thead>
<tbody>
<tr>
<td>¹Preliminary Expenses</td>
<td>5.0% 30.11</td>
</tr>
<tr>
<td>²Initial Working Capital</td>
<td>45.00</td>
</tr>
<tr>
<td>³Project Management</td>
<td>4.5% 27.10</td>
</tr>
<tr>
<td>Interest during Construction</td>
<td></td>
</tr>
<tr>
<td><strong>Total Soft Cost</strong></td>
<td><strong>276.45</strong></td>
</tr>
</tbody>
</table>

**Table 11.15: Total Capital Cost Estimate for Construction (BCL Layout)**

<table>
<thead>
<tr>
<th>Total Capital Cost</th>
<th>m Tk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Cost</td>
<td>602.24</td>
</tr>
<tr>
<td>Soft Cost</td>
<td>276.45</td>
</tr>
<tr>
<td><strong>Total Capital Cost</strong></td>
<td><strong>878.69</strong></td>
</tr>
</tbody>
</table>

Total capital cost is estimated to be Tk 878.69 million (2013 Tk) in the BCL prepared layout.
11.11 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. In addition, ancillary facilities such as generators, lifts etc will be needed in Year 3 of construction while upfront costs such as land filling will be need in Year 1.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Hard Costs</td>
<td>Tk 114.52</td>
<td>Tk 145.86</td>
<td>Tk 306.24</td>
</tr>
<tr>
<td>Total Soft Costs</td>
<td>Tk 105.37</td>
<td>Tk 79.09</td>
<td>Tk 88.66</td>
</tr>
<tr>
<td>Total Capex</td>
<td>Tk 219.89</td>
<td>Tk 224.95</td>
<td>Tk 394.91</td>
</tr>
</tbody>
</table>

Summary of the capital expenditure spread in the base case option is shown in Table 11.16.

11.12 Revenue Projection

The Operator’s revenue is expected to be generated from the following sources:

- Lease rentals from ICT Units:
  - Software Development and Services units
  - BPO units
  - Training centers
  - Other ICT units

- Lease Rental from Data Center
- Lease rentals from Banks
- Lease rentals from Cafeteria
- Lease rentals from Conference Hall
- O&M Service Charge from Tenants

Approximate share of revenue for each revenue source is shown in Table 11.17 and Figure 11-12.

<table>
<thead>
<tr>
<th>Commercial Facilities</th>
<th>Share of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease rentals from ICT Units:</td>
<td></td>
</tr>
<tr>
<td>Software Development and Services units</td>
<td>33%</td>
</tr>
<tr>
<td>BPO units</td>
<td>7%</td>
</tr>
<tr>
<td>Training Center</td>
<td>4%</td>
</tr>
<tr>
<td>Other ICT units</td>
<td>2%</td>
</tr>
</tbody>
</table>
Revenue projection is derived from the demand forecast of space take-up in the ICT Village 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.

11.12.1 **Lease Rates**

Operator of the ICT Village will lease out ICT office spaces and commercial spaces in the MTB of the ICT Village and receive revenue. The lease rates estimated in the model are shown in Table 11.18.
The lease rates for the office and commercial spaces have been based on the lease rates of similar facilities in Jessore. Market survey for the project in Jessore demonstrated that ICT firms in the area currently pay approximately Tk 20/sft/month as rent for their offices. Since the ICT Village 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 Jessore.

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.

### 11.12.2 O&M Service Charge

Operator of the ICT Village will charge monthly O&M Service Charge to the building tenants for operations and maintenance of the facilities in addition to lease rentals for renting office and commercial space. The estimated O&M Service Charge rate is given in Table 11.19.

<table>
<thead>
<tr>
<th>Service Charges</th>
<th>Rate</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>O&amp;M Service Charge</td>
<td>2.50</td>
<td>Tk/sft/month</td>
</tr>
</tbody>
</table>

The O&M service charge will be collected for services such as:

- Landscaping
- Security
- Cleaning and maintenance
- Lobby and passage lighting
### 11.13 Operation and Maintenance Costs

Table 11.20 shows the parameters used in the model with regards to different types of operations and maintenance costs associated with the operation of the ICT Village. Maintenance of roads, sewerage system, standby 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 park such as landscaping, security etc. All such costs have been incorporated in the model.

**Table 11.20: O&M Cost Items**

<table>
<thead>
<tr>
<th>Annual Operations and Maintenance Costs</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Road works including pavements, parking and concourse</td>
<td>% of capital cost</td>
<td>2.0%</td>
</tr>
<tr>
<td>Sewerage system including deep tube well</td>
<td>% of capital cost</td>
<td>4.0%</td>
</tr>
<tr>
<td>Electrical works including Transformer, street lighting and generators</td>
<td>% of capital cost</td>
<td>2.0%</td>
</tr>
<tr>
<td>Buildings - MTBs and dormitory</td>
<td>% of capital cost</td>
<td>0.2%</td>
</tr>
<tr>
<td>ICT/Telecom network</td>
<td>% of capital cost</td>
<td>5.0%</td>
</tr>
<tr>
<td>Landscaping</td>
<td>% of capital cost</td>
<td>5.0%</td>
</tr>
<tr>
<td>Security</td>
<td>200,000 Tk/ per month</td>
<td></td>
</tr>
</tbody>
</table>

The ICT Village will need a set of dedicated staff to see to the operations of the park. It is estimated that a manpower of 10 employees will be adequate for operations. Salary for dedicated staff is also included in the total O&M cost of the ICT Village. Organogram along with estimated salary of the staff is given in Table 11.21.

**Table 11.21: Management Structure**

<table>
<thead>
<tr>
<th>Management Structure</th>
<th>Employees for running ICT Village Operation</th>
<th>No. of employees</th>
<th>Avg. Salary/month (Tk)</th>
<th>Avg. Salary/year (m Tk)</th>
<th>Total (m Tk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management</td>
<td></td>
<td>1</td>
<td>125,000</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Middle Management</td>
<td></td>
<td>2</td>
<td>50,000</td>
<td>0.60</td>
<td>1.20</td>
</tr>
<tr>
<td>Lower Management</td>
<td></td>
<td>2</td>
<td>30,000</td>
<td>0.36</td>
<td>0.72</td>
</tr>
<tr>
<td>Secretarial</td>
<td></td>
<td>5</td>
<td>15,000</td>
<td>0.18</td>
<td>0.90</td>
</tr>
</tbody>
</table>

**Total**: 4.32 m Tk
11.14 Results of Financial Model

Key financial indicators of the project in the Base Case Scenario are presented in Table 11.22 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 11.22: Key Financial Indicators in the Base Case Scenario

<table>
<thead>
<tr>
<th>Output</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity IRR</td>
<td><strong>11.50%</strong></td>
</tr>
<tr>
<td>Project IRR</td>
<td><strong>11.92%</strong></td>
</tr>
<tr>
<td>DSCR</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td><strong>1.48</strong></td>
</tr>
<tr>
<td>Maximum</td>
<td>1.53</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.27</td>
</tr>
<tr>
<td>Equity Payback Period (year)</td>
<td><strong>20</strong></td>
</tr>
<tr>
<td>Project Payback Period (year)</td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Figure 11-13 shows the projected revenue and income after tax of the ICT Village business. After an initial period of low income, the project is expected to generate profit for the Government.
11.14.1 Return from the Project in the Base Case

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 11.92% and a return of 11.50% on equity. It will take 15 years for investment payback, with equity payback occurring in 20 years. An equity rate of return above 10% indicates that the project is financially viable.

11.14.2 Debt Service Coverage Ratio (DSCR) in the 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 indicates that the project generates enough revenue to cover annual debt payments.

The DSCR of the project in the base case scenario is shown in Figure 11-14. The average DSCR is 1.48 which indicates that the project will generate enough revenue to cover loan payments.

### 11.15 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 11.23 and Error! Reference source not found..

<table>
<thead>
<tr>
<th>Equity IRR Sensitivity</th>
<th>-20%</th>
<th>-10%</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost</td>
<td>13.3%</td>
<td>12.4%</td>
<td>11.50%</td>
<td>10.7%</td>
<td>10.0%</td>
</tr>
<tr>
<td>O&amp;M Cost</td>
<td>11.9%</td>
<td>11.7%</td>
<td>11.50%</td>
<td>11.3%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Lease Rate</td>
<td>9.0%</td>
<td>10.3%</td>
<td>11.50%</td>
<td>12.6%</td>
<td>13.7%</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>13.0%</td>
<td>12.3%</td>
<td>11.50%</td>
<td>10.7%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>
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 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 ICT Village and hence negatively affect the IRR. Therefore, lease rates for office spaces needs to fixed keeping in mind bot he demand and financial viability.

After lease rates, Capital Cost of the project and the interest rate of loan have the biggest impacts on the return of the project. The higher the capital cost and interest rate, the lower in 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.

Interest rate for loans in the project also has significant impact on the financial health of the project. Therefore, efforts may be taken by implementing agency to obtain lower rate loans and/ or loans with higher grace periods.
The financial model was used to model six different scenarios, including the base case scenario, of different combinations of demand projections and site layout. The three demand forecast scenarios are as follows:

**Base Case**: Office space take-up in 7 years

**Optimistic Case**: Office space take-up in 5 years

**Conservative Case**: Office space take-up in 10 years

The two different masterplan layouts were:

**UH Layout**: Masterplan Layout prepared by Urban Habitat Consultants

**BCL Layout**: Masterplan Layout prepared by BCL Associates

Results of the financial analysis of the different scenarios are given in Table 11.24.

<table>
<thead>
<tr>
<th>Scenario Analysis</th>
<th>UH Layout</th>
<th>BCL Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equity IRR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>11.5%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>11.8%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>11.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td><strong>Project IRR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>11.9%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>12.1%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>11.6%</td>
<td>10.1%</td>
</tr>
<tr>
<td><strong>Average DSCR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>1.48</td>
<td>1.23</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>1.50</td>
<td>1.24</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>1.46</td>
<td>1.21</td>
</tr>
<tr>
<td><strong>Equity Payback Period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td><strong>Project Payback Period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Optimistic Case</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>15</td>
<td>17</td>
</tr>
</tbody>
</table>

Scenario analysis of different options demonstrate that the Urban Habitat Layout provides better financial returns for the project. It may also be noted 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.

Overall, financial analysis of the base case and of different scenarios indicate that the project will be financially viable for implementation by the Government.
12

Environmental and Social Analysis
12 ENVIRONMENTAL AND SOCIAL 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. However, ICT has an environmental impacts through construction of buildings, the manufacturing, operation and disposal of devices and network equipment, but it also provides ways to mitigate the adverse effects as well as 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 EPR 97 includes lists of projects, requiring varying degrees of environmental investigation. All the proposed projects under Orange (B) and Red category generally will require an IEE for environmental clearance. Though this type of project is not categorized under the legislative documents of DOE, ICT Village at Jessore may be labeled as Orange B category due to its environmental hazard during project construction phase. 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 where adverse effects and mitigation measures as well as benefits would be addressed.

12.1 Objectives of IEE

The overall objective IEE is to identify major environmental impacts resulting from implementation of the project and to recommend mitigation measures to avoid or reduce adverse environmental 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 would be compared.

ii. To identify and assess impacts resulting from the project its development or construction phase.

iii. To identify and assess environmental and social 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.

### 12.2 IEE Study Methodology

The study methodology comprised the following activities:

1. Desktop study;
2. Field investigations.

#### 12.2.1 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.

#### 12.2.2 Field investigations

Field investigations involved:

Site walks within the project area and the neighbouring areas that may be affected by the project:

a) Taking photographs of significant aspects to assist in describing the baseline environmental and social conditions of the project area;

b) Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties mainly within the project influence zone;

c) 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 bases of collected relevant 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 19 September 2013. The investigation team composition is given below:

1. Mr. Amzad Hossain  Group Manager and Environmental Expert, IIFC
2. Mr. Mahbub Alam, Consultant and ICT Expert, IIFC

The basic objective of the field investigation is to have a general overview of the proposed site and to understand people’s views through brief consultation on development and to investigate social, technical and economic aspects of the proposed ICT. The visiting team also had discussion meetings with government agencies involved with the basic utilities services like power, water supply and others.

12.2.3 The Site

The site for the project is located at Nazirshankarpur at the Jessore town, which is in the south-western tip of Bangladesh. The proposed site is only 0.5 km from Jessore – Khulna Highway and 8 km away from Jessore Airport and about 3 km from the Railway Station. The approach road to the site from the main highway is of good quality but narrow (5 meter wide).

The land area of the proposed site for the development of ICT Village is 3.03 acres from two different mouzas – 2.25 acres of land from the Barandi mouza of J.L no. 91 and 0.78 acre from Shankarpur mouza of J.L. no. 82. The land was previously owned by Public Works Department (PWD) for developing a brick field in that place. The Ministry of Land allotted the site for establishing the proposed ICT Village by transferring ownership from PWD, Jessore to MoICT.

Jessore Regional Passport Office and Technical Training Centre are situated in the western side of the site. There is a public library in the north-west corner. In the south-west corner there is a six-storied building of Department of Social Services (DSS).
The proposed site and its environs are depicted in the following figures.

**Figure 12-1: Proposed Site and its Environs**

The site is a non-arable flat land with a shallow ditch in the middle. It is almost vacant and no structures or settlements are identified on the site except two semi-pacca houses which are being used for residential purpose by the fourth class employees of PWD. There are six families staying in these houses for more than 15 years and they informed the consultants that they will leave these houses as soon as construction work starts. The local households are situated around the periphery of the proposed site.

12.3 Bio-Ecological and Geographic Location

Jessore is located in the Ganges floodplain, which is basically consisted of the active floodplain of the Ganges River and the adjoining meandering floodplains. This floodplain includes mostly greater Jessore, Kustia, Faridpur and Barisal districts. The floodplain comprises of ridges, basins and old channels. The Gangetic alluvium is readily distinguished from the old Brahmaputra, Jamuna and Meghna sediments by its high lime contents. Ganges channel is constantly shifting within its active floodplain, eroding and depositing large areas of new char lands in each flooding season, but it is less braided than that of the Brahmaputra-Jamuna.

The floodplain is characterized by mixed vegetation. Large number of stagnant water bodies and channels, rivers and tributaries support a habitat
of rich biodiversity. Free-floating aquatic vegetation is commonly shown in most of the wetlands. Both cultivated and wild plants species are found in homesteads forest. Major groups of the oriental birds are represented in this zone by many species. A large number of migratory birds are observed in winter. Different species of tortoises and turtles are found in perennial water bodies.

12.4 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.

12.4.1 Physical Environment

Climate

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 Dhaka Metrological Station are presented in the following paragraphs.

i. Temperature

The seasonal changes in temperature are noticeable throughout the year, with the warmest months being from April to October and the coolest months being January, February, November and December.

In the year 2012, the maximum temperature was 40.8°C recorded in the month of June and the minimum temperature was 6.2°C recorded in the month of January. The year wise temperature range for last decade is shown in the following table.

---

5 Source: Dhaka Metrological Station
### Table 12.1: Annual Temperature Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Minimum Temperature</th>
<th>Maximum Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Degree (°C)</td>
<td>Month</td>
</tr>
<tr>
<td>2003</td>
<td>5.0</td>
<td>January</td>
</tr>
<tr>
<td>2004</td>
<td>5.4</td>
<td>February</td>
</tr>
<tr>
<td>2005</td>
<td>8.8</td>
<td>January</td>
</tr>
<tr>
<td>2006</td>
<td>6.2</td>
<td>January</td>
</tr>
<tr>
<td>2007</td>
<td>7.0</td>
<td>January</td>
</tr>
<tr>
<td>2008</td>
<td>7.6</td>
<td>February</td>
</tr>
<tr>
<td>2009</td>
<td>6.0</td>
<td>December</td>
</tr>
<tr>
<td>2010</td>
<td>6.7</td>
<td>January</td>
</tr>
<tr>
<td>2011</td>
<td>4.5</td>
<td>January</td>
</tr>
<tr>
<td>2012</td>
<td>6.2</td>
<td>January</td>
</tr>
</tbody>
</table>

The above table shows the minimum recorded temperature throughout the last decade was 4.5°C in the month January 2011, while the maximum temperature recorded 40.8°C in the month June 2012.

#### ii. 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 Jessore during the period 2003-2012 is well depicted by the data in the following table.

### Table 12.2: Relative Humidity at Jessore

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>81</td>
<td>76</td>
<td>75</td>
<td>76</td>
<td>73</td>
<td>83</td>
<td>84</td>
<td>83</td>
<td>86</td>
<td>88</td>
<td>79</td>
<td>82</td>
<td>80</td>
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<td>87</td>
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<td>74</td>
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<td>2008</td>
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<td>2011</td>
<td>77</td>
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<td>85</td>
<td>79</td>
<td>79</td>
<td>81</td>
<td>78</td>
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</tbody>
</table>
Feasibility Study for Jessore Software Technology Park

Chapter 12: Environmental and Social Analysis

## Monthly Mean Humidity (in Percentage)

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>80</td>
<td>71</td>
<td>67</td>
<td>72</td>
<td>69</td>
<td>77</td>
<td>84</td>
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<td>84</td>
<td>81</td>
<td>78</td>
<td>81</td>
<td>77</td>
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<tr>
<td>Average</td>
<td>79</td>
<td>74</td>
<td>71</td>
<td>73</td>
<td>74</td>
<td>81</td>
<td>85</td>
<td>85</td>
<td>85</td>
<td>83</td>
<td>79</td>
<td>80</td>
<td>79</td>
</tr>
</tbody>
</table>

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 79%.

### iii. Rainfall

Jessore is located in highly rainfall prone areas and the annual rainfall ranges from 1300 mm to more than 2400 mm with an average 1750 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 2444 mm in the year 2004 and 1305 mm in the year 2012. The monthly rainfall during the last decade is depicted in the following table.

**Table 12.3: Rainfall at Jessore (in mm)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Ann</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0</td>
<td>5</td>
<td>119</td>
<td>49</td>
<td>72</td>
<td>404</td>
<td>427</td>
<td>177</td>
<td>148</td>
<td>466</td>
<td>0</td>
<td>25</td>
<td>189</td>
</tr>
<tr>
<td>2004</td>
<td>3</td>
<td>0</td>
<td>9</td>
<td>70</td>
<td>138</td>
<td>305</td>
<td>398</td>
<td>347</td>
<td>917</td>
<td>257</td>
<td>0</td>
<td>0</td>
<td>244</td>
</tr>
<tr>
<td>2005</td>
<td>33</td>
<td>16</td>
<td>129</td>
<td>31</td>
<td>59</td>
<td>141</td>
<td>546</td>
<td>115</td>
<td>194</td>
<td>412</td>
<td>2</td>
<td>0</td>
<td>167</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>52</td>
<td>302</td>
<td>214</td>
<td>455</td>
<td>316</td>
<td>400</td>
<td>16</td>
<td>13</td>
<td>0</td>
<td>176</td>
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<tr>
<td>2007</td>
<td>0</td>
<td>66</td>
<td>21</td>
<td>62</td>
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<td>299</td>
<td>259</td>
<td>116</td>
<td>113</td>
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<td>2008</td>
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<td>35</td>
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<td>208</td>
<td>242</td>
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<td>204</td>
<td>415</td>
<td>179</td>
<td>0</td>
<td>0</td>
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<td>2009</td>
<td>0</td>
<td>7</td>
<td>33</td>
<td>0</td>
<td>170</td>
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<td>369</td>
<td>386</td>
<td>438</td>
<td>94</td>
<td>1</td>
<td>1</td>
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<tr>
<td>2010</td>
<td>0</td>
<td>8</td>
<td>11</td>
<td>37</td>
<td>264</td>
<td>329</td>
<td>155</td>
<td>232</td>
<td>186</td>
<td>122</td>
<td>4</td>
<td>32</td>
<td>138</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>0</td>
<td>34</td>
<td>33</td>
<td>132</td>
<td>314</td>
<td>296</td>
<td>306</td>
<td>227</td>
<td>18</td>
<td>1</td>
<td>0</td>
<td>136</td>
</tr>
<tr>
<td>2012</td>
<td>31</td>
<td>4</td>
<td>5</td>
<td>82</td>
<td>36</td>
<td>221</td>
<td>334</td>
<td>187</td>
<td>271</td>
<td>71</td>
<td>61</td>
<td>2</td>
<td>130</td>
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<tr>
<td>Month</td>
<td>14</td>
<td>14</td>
<td>40</td>
<td>46</td>
<td>154</td>
<td>263</td>
<td>417</td>
<td>257</td>
<td>346</td>
<td>175</td>
<td>20</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

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).

### iv. Topography

The construction site and its vicinity are relatively plain in nature.

### v. 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, Jessore is far away from the cyclone affected area.

**Figure 12-2: Cyclone Affected Area in Bangladesh**

vi. Earthquake

Status of earthquakes Bangladesh is surrounded by the regions of high seismicity which include the Himalayan Arc and Shillong plateau in the north, the Burmese Arc, Arakan Yoma anticlinorium in the east and 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.
Jessore fails under Zone III with less seismic coefficient and far away from seismic sources. As such, Jessore is out of earthquake prone area.

12.4.2 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.

vii. 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 some natural trees. Herb and shrub are few in number and some grows naturally adjacent to the project area. The site is predominantly covered by grassland, with traces of shrubs. The soil is generally covered with green grass that may be attributed to the climate. Weed plants and shrubs were also noted.

The Most of the homestead cover consists of timbers plant species, few medicinal plants and some vegetables and fruit trees. These provided roosting area for the local resident birds. The roadside vegetation is mostly planted.

Kopothakha and Voirab River are the habitat of good number of fish. The site is devoid of any large animals but there presence of pet animals. Local farmers however graze their livestock mainly goats and cattle at the site area. Insects and small birds were found at the project site. The terrestrial and aquatic flora and fauna at the project site are given in the following figures.

Figure 12-4: Terrestrial Flora around the Project Site
12.4.3 Socio-economic Environment

viii. Populations and Demographics

Jessore District had a population of 2,764,547 at the 2011 Census. 85.5% of the population are Muslims, 14.21% are Hindus and the remaining 0.29% practice another religion. Religious institutions included 3928 mosques, 463 temples, 86 churches and 17 Buddhist temples.

The average literacy rate is 45.2% - very low compared to the rest of the world. 41% of males and 25.1% of females are literate.

The main occupations are agriculture 39.84%, agricultural labourer 24.13%, wage labourer 2.68%, commerce 11.99%, service 8.66%, industry 1.41%, transport and others 8.18%.

The main crops are paddy, jute, sugarcane, tuberose, vegetables. Main fruits are date, jackfruit, papaya, banana, litchi and coconut. Main exports are cotton, jute, leather, jackfruit, banana, comb and date molasses, and vegetables. Jessore is a place for growing flowers.

12.5 Environmental Impacts During Construction and Operation 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.
12.5.1 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;

i. 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 renewable sources of energy and recycling of waste water into the design of the Jessore ICT Village development ensure that environmental considerations have been taken into the concept of the development making it environmentally friendly

ii. Negative 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.

12.5.2 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 by 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 building when not designed in considering the landscape, it creates visual intrusion to 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 will be on abandoned land previously owned by PWD for several years and it will be within the existing some establishment/offices premises all around. 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.
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 greenhouse gases.

12.5.3 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 are lived near to the project, including women. 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 on Disposal of IT Equipment

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 of 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.

iii. Mitigation Measure on Disposal Hazard

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.

### 12.6 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.

The social impact of the facility is given below.

- **i. Increase Job Opportunities:** The proposed ICT Village would increase the possibilities of suitable employment to the locals.

- **ii. Increase Land Value and Demand for Houses:** The presence of Jessore 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 project.

- **iii. Opportunities for Business:** Jessore 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. No Involuntary Settlement:** During field visit at site it is understood that there are two semi-pacca houses which are being used for residential purpose by the fourth class employees of PWD. There are six families staying in these houses. Without two semi-pacca houses, most of the areas are vacant of the proposed project. They informed the consultants that they will leave these houses as soon as construction work starts. So, involuntary displacement is not applicable for this project.

- **vi. Effects on Human Health, Occupational Health and Safety**

  The facility will be operated in a clean operation process and operation does not involve toxic chemicals or hazardous substance, human health and occupational health concerns are expected to be minimal out of its operation.
On the other hand the project proponent will keep provision for adequate firefighting equipment against the fire hazards with first aid medical facilities and proper ventilation.

12.6.1 Public/Stakeholders Consultations

The consultants discussed with stakeholders including government officials, district administration and community members in the districts relevant to the proposed project. The objective of the discussions was to collect the stakeholders’ views on the proposed project. The photographs of discussion meetings are given below.

**Figure 12-6: Discussion Meeting with DC Jessore**

In the discussion meeting held with Deputy Commissioner Jessore it was informed that Jessore has good communication network (Road, Rail and Air Ways) with Capital city Dhaka. Moreover, a high capacity territorial optical fiber line, between India and Bangladesh passing through Jessore, will enhance interconnectivity across the world. The ICT village will be benefitted from this network. He also added that being a earthquake free zone, Jessore is regionally suitable for establishing ICT hub.

**Figure 12-7: Discussion Meeting with ADC (Revenue), Jessore**
In the discussion meeting, Additional Deputy Commissioner (Revenue) informed that concurrence from the Ministry of Land regarding transferring ownership from Public Works Department, Ministry of Land to the Ministry of Information and Communication Technology (MoICT), has been obtained. The transferring process is to be carried out under section 75 of “Acquisition of Immovable Property Manual 1997”.

Figure 12-8: Consultation with Stakeholders

The discussion with stakeholders was focused on the project impacts and mitigation measures. The general response of the stakeholders was in favour of the proposed project.

Figure 12-9: Consultation with People residing at the Site

The issues require consideration according to the stakeholders included vegetating the project area, soil erosion prevention and traffic congestion.

12.7 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 private investor.

### 12.7.1 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 12.4: Environmental Management Plan

<table>
<thead>
<tr>
<th>Issues</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
<th>Phase/s</th>
<th>Responsible Organization/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing the ground for construction site</td>
<td>Soil erosion, vegetation disruption</td>
<td>• Re-vegetation and soil compaction can be minimized the effects.</td>
<td>Construction</td>
<td>Contractors and Supervising Consultants</td>
</tr>
<tr>
<td>Surface and ground water pollution</td>
<td>Contamination surface water or ground water</td>
<td>• Wastes should be disposed of properly away from site.</td>
<td>Design and construction phase</td>
<td>Contractors and Supervising Consultants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Septic tanks and soak wells should be with proper design.</td>
<td></td>
<td>Project Implementation Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pollutant materials such as fuels, lubricants, detergents, cement and others must be handled properly to avoid spills;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimizing disturbance of the groundwater level;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Washing of vehicles and equipment on the site shall be restricted.</td>
<td></td>
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<td></td>
<td></td>
<td>• the system for the sludge/slurry/back wash water production should</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ensure minimization of leakages of it to groundwater.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Chapter 12: Environmental and Social Analysis

<table>
<thead>
<tr>
<th>Issues</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
<th>Phase/s</th>
<th>Responsible Organization/ Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Air/Dust pollution</strong></td>
<td>Health hazard to labours and residents</td>
<td>• Watering of dusty roads;</td>
<td>Construction and operation phases</td>
<td>Contractors/ Supervising Consultants PIU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sprinkling and covering stockpiles;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Water will be sprayed to suppress dust on an as required basis in construction phase.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Noise/vibration pollution</strong></td>
<td>Hearing hazards to labours and residents</td>
<td>• Scheduling of transportation not to disturb the community;</td>
<td>Construction and operation phases</td>
<td>Contractors/ Supervising Consultants PIU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The vehicles and equipment should be inspected regularly to ensure its proper functioning and limit the release of fumes/noise;</td>
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<td></td>
<td></td>
<td>• The machineries should have silencing devises</td>
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<td></td>
<td></td>
<td>• Ear muffs will be supplied for workers to wear, when working close to machinery to protect noise.</td>
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<td></td>
<td></td>
<td>• 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.</td>
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<td></td>
<td></td>
<td>• Canopy built generator should be provided.</td>
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<tr>
<td>Issues</td>
<td>Potential Impact</td>
<td>Mitigation Measures</td>
<td>Phase/s</td>
<td>Responsible Organization/Person</td>
</tr>
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<td>-----------------------------</td>
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<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Waste/ sludge disposal</td>
<td>Management of biotic environment</td>
<td>• Wastes and debris should be disposed properly</td>
<td>Pre-construction, construction and operation phases</td>
<td>Contractors/Supervising Consultants/PIU</td>
</tr>
<tr>
<td></td>
<td>Contamination of biotic environment</td>
<td>• Construction debris must be stockpiled and removed to a safe site.</td>
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<td></td>
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<td>• Do not drop or expose any debris while transporting.</td>
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<td></td>
<td>• 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.</td>
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<td>• The retention/settling basin be based on soil or rock, capable to support the maximum load of the basin;</td>
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<td></td>
<td>• 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.</td>
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<td></td>
<td>• Finally, the transference of retention/settling sludge to the landfill of inert material should be made to avoid any contamination of soil or water.</td>
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</tr>
<tr>
<td>Issues</td>
<td>Potential Impact</td>
<td>Mitigation Measures</td>
<td>Phase/s</td>
<td>Implementation</td>
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<tr>
<td>6.</td>
<td>Soil erosion</td>
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<td></td>
<td>Land slide/battered slope, rain-cut etc.</td>
<td>• Ensure, layer to layer compaction, soil stabilization measures</td>
<td>Construction and O&amp;M phase</td>
<td>Contractors/Supervising Consultants PIU</td>
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<tr>
<td></td>
<td></td>
<td>• Re-vegetate and restore disturbed soil</td>
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<td></td>
<td>• Shrub/ herbs and Tree plantation may reduce soil erosion.</td>
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</tr>
<tr>
<td>7.</td>
<td>Loss of soil fertility due to cut of top soil layer for construction</td>
<td>• To avoid loss of soil fertility, due to cut 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.</td>
<td>Construction phase</td>
<td>Contractors/Supervising Consultants PIU</td>
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<td>The top soil (6 inches) contains the elements of essential soil nutrients, if the cut of the top soil layer occurs for construction, soil fertility might be reduced hampering the normal life.</td>
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<td>8.</td>
<td>Trees and vegetation</td>
<td>• Enhance environment by tree plantation in proper place of the project premises and by the approach road side</td>
<td>Construction phase and Operation phase</td>
<td>Contractors/Supervising Consultants PIU</td>
</tr>
<tr>
<td></td>
<td>Deforestation and desertification</td>
<td>• Re-vegetation of barren surfaces be encouraged.</td>
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</table>
### Chapter 12: Environmental and Social Analysis

#### Mitigation Measures Table

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
<th>Phase/s</th>
<th>Responsible Organization/Person</th>
</tr>
</thead>
</table>
| 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 |
### Health and Safety

<table>
<thead>
<tr>
<th>Issues</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
<th>Phase/s</th>
</tr>
</thead>
</table>
| 11     | 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 |
12.8 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:

i. Ensure that the EMP is implemented;

ii. Evaluate the effectiveness of the mitigation measures;

iii. Verification 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

Project Implementation
13 PROJECT IMPLEMENTATION

Project implementation encompasses all activities that need to be undertaken in transforming the project from plans to physical reality. The activities involved in project implementation are to be carried out in two phases. The first phase is the pre-construction phase, which includes consents and approvals from concerned authorities, project financing, and engagement of implementation support consultant and construction contractor and such. The main construction work of the project facility starts in the second phase, known as the construction phase. The following sections describe briefly the key activities of these two phases.

Figure 13-1: Sequence of Proposed Activities

13.1 Environmental Clearances

As per the Environment Conservation Rules, 1997 of Bangladesh, this project will fall under Orange B category for taking the environmental clearance from Department of Environment (DoE). If the project needs to be financed from the private sector window or any private sector financing facility of multilateral donors, it is imperative to carry out EIA and SIA as per the standard Environmental and Social Management Framework (ESMF). The following steps need to be adopted to obtain environmental clearances with respect to the new facility.
13.1.1 Obtaining Site Clearance Certificate

The new facility needs to obtain Site Clearance Certificate (SCC) first. For obtaining SCC the documents in the footnote 6 need to be submitted to the DoE. Upon receiving Site Clearance Certificate the Executing Agency may engage contractor for initial on-site development activities like land development and boundary wall construction.

13.1.2 Obtaining Approval for Environmental Impact Assessment

The new facility needs to have EIA report to be approved by the Department prepared on the basis of terms of reference (ToR) outlined in IEE Report along with time schedule.

As a linked project, the EIA has to be initiated by BHTPA, possibly supported by the donor, just after the Feasibility Study is completed. The EIA needs to be prepared in consultation with the donor. After preparing the EIA report, BHTPA may apply for clearance of the EIA to the DoE.

13.1.3 Obtaining Environmental Clearance Certificate

After obtaining approval for EIA, the BHTPA will apply for Environmental Clearance Certificate (ECC). For obtaining ECC the documents in the footnote 7 need to be submitted to the DoE. Without ECC, the new facility

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6 For obtaining SCC the following documents need to be submitted by BHTPA to DOE:

1. Application Form
2. Feasibility Report
3. 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
4. No objection certificate of the local authority.
5. Emergency plan relating adverse environmental impact and plan for mitigation of the effect of pollution.
6. Outline of relocation, rehabilitation plan (where applicable).
7. Other necessary information (where applicable).

7 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
will not receive utility connection, and cannot start operation. Responsibility with respect to Environmental Clearances

The following table shows the responsibly of BHTPA regarding the Environmental Clearances:

<table>
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<tr>
<th>Tasks</th>
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<tbody>
<tr>
<td>(a) Preparing IEE</td>
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<tr>
<td>(b) No Objection for Local Authority</td>
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<tr>
<td>(c) Submitting application for SCC</td>
</tr>
<tr>
<td>(d) Preparing EIA</td>
</tr>
<tr>
<td>(e) Submitting application for EIA Approval and receiving EIA Approval</td>
</tr>
<tr>
<td>(f) Preparing all supporting documents for submitting application for ECC (except items d, e, i, j of footnote 7)</td>
</tr>
<tr>
<td>(g) Submitting application for ECC and receiving the ECC from DoE</td>
</tr>
</tbody>
</table>

13.2 Engagement of Implementation Support Consultant

BHTPA has engaged BCL Associates Limited (BCL), a consultancy firm, for architectural and engineering consultancy services. A contract was signed between BHTPA and BCL on 18 August 2013 and the tenure of the contract is two years. The firm has been engaged to prepare detailed engineering designs and bidding documents, undertake or assist in the evaluation of bids, supervise the construction of civil works, and carry out other specific project activities.

13.3 Project Financing Arrangement

The DPP shows that the project will be financed by the government by mobilizing its resources. The implementation model as described in the section 9.3.1 (Option A: Government Led Model) may be appropriate for this project. To finance development activities, the government mobilizes resources in two ways: internally and externally. The external resources include foreign aids either in the form of grants or loans. The procedure for obtaining foreign aid does not follow a regular set of processes as different project follow different approaches. The procedure is very lengthy and it is

(l) Certificate from BoI/Bank/financial institution indicating date of establishment of the facility
(m) License from Fire Service
(n) IEE report
(o) EMP report
considered advisable to contact potential donors as soon as the feasibility study completed.

The executing agency will provide the lender copies of full feasibility report along with an offering memorandum, describing precisely the project and proposed financing terms. Then the lenders will undertake due diligence over the project’s technical and economic viability before making a formal commitment to lend. Most aid organizations have their own mix of criteria of assessing the project viability and the availability of competence that can be brought into the implementation process. Subsequent to the exercise of due diligence, lenders negotiate with appropriate government agencies to set forth the basic terms and conditions of their loans. Following that, a loan agreement will be signed when both the parties are agreed upon the terms and conditions.

13.4 Engagement of Construction Contractor

At this stage, BHTPA with the help of consultants of BCL will perform a series of activities to engage the Construction Contractor. In most civil works contracts, prequalification of contractors is required before bids are invited. Only the contractors who have been prequalified will be invited to submit bids.

The major tasks to be carried out are as follows:

1. Prepare prequalification documents, which consist of the prequalification invitation, scope of contract, proposed prequalification methodology and criteria.
2. Publishing notification in newspapers for qualification document and arranging a conference for the interested firms
3. Assessing qualification statements and notifying the pre-qualified firms
4. Preparing tender documents
5. Publishing of tender notification in press and providing tender document to the pre-qualified contractors
6. Arranging pre tender conference and providing clarification to the queries of the prospective contractors
7. Modifying tender documents (on agreed issues of the queries of contractors)
8. Forming a tender evaluation committee and evaluation of the tenders
9. Issuing a Letter of Intent (LOI) to the successful contractor, negotiating with the successful contractor and receiving performance guarantee from contractor
10. Signing the agreement (Contract) with successful contractor
13.5 ICT Business Incubation Ecosystem

It is evident from the findings of market survey that most of the IT companies do not have much motivation to relocate to the proposed ICT Village, except those companies having expansion plans. However, it is expected that in the long term, the ICT Village will become a tech-hub for accommodating large domestic players even global IT services players for setting up their software development centres and BPO facilities. Hence, the need for promoting entrepreneurship is highly critical.

The proposed ICT Village project is currently in the design phase. It will take about three years for the construction works to be completed. During the construction period, the authority may work out a plan to kick-start ICT development activities by promoting ICT-based entrepreneurship in that locality. To this end, BHTPA may undertake a pilot programme to set up an incubation ecosystem. A local business incubation ecosystem will help nurture entrepreneurship by providing support to early-stage start-ups. The ICT Village will gain when these start-up companies become regular occupants after a certain period.

To create an incubation ecosystem, it is imperative to have linkage to centres of excellence and IT industry body. The authority may adapt institutional arrangements by entering into a tripartite partnership with BHTPA as the executing agency, Jessore Science & Technology University (JSTU) as the centre of excellence and BASIS as the industry body for the ICT sector. The partnership will provide a satisfactory basis for the proper management of the incubation facilities.

Figure 13-2: ICT Business Incubation Ecosystem

A typical ICT incubator provides business services, training, mentoring, and reasonably priced space, connections to industry and academia, and introductions to potential investors and links to global markets.
13.5.1 Roles of Parties involved

The tripartite arrangement needs to stipulate individual roles of involved parties (i.e. BHTPA, JSTU and BASIS). Some of the major activities are mentioned as follows:

- BHTPA will play a supportive and proactive role in formulating efficient institutional and implementation mechanism for the incubation ecosystem. They will monitor periodically to observe the progress of the facility.

- Unlike other industrial clusters, ICT Villages are not constrained by factors such as the availability of natural resources, or raw materials. The key resource requirement is availability of quality manpower. Therefore, close working relationships with academic institutions such as universities and colleges and R&D institutions are essential to bring world-class IT training standards and certifications to foster skills development and to promote innovation. JSTU will play vital role in this regard.

- BASIS facilitates market development through networking and business linkage events as well as brand promotion of the industry at domestic and international level. For this incubation facility, it will act as a bridge between industry and start-ups. It will also maintain interaction with universities on industry’s current and future skills requirements for ensuring necessary changes in curriculum.

The incubator can be set up at rented facility in a cost effective way rather than constructing a new one and may continue its operation there for about four years. By that time the proposed ICT Village will came into operation and consequently, the incubator can be relocated to the Village permanently.
# Chapter 13: Project Implementation

## Indicative Implementation Schedule

### Development of ICT Village at Jessore

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Feasibility Study Completed</td>
<td>0 mons</td>
</tr>
<tr>
<td>2</td>
<td>Pre-construction Phase</td>
<td>10.5 mons</td>
</tr>
<tr>
<td>3</td>
<td>Environmental Aspects</td>
<td>5 mons</td>
</tr>
<tr>
<td>4</td>
<td>Receive Site Clearance from DOE</td>
<td>0 mons</td>
</tr>
<tr>
<td>5</td>
<td>Receive NOC from Local Authority</td>
<td>0 mons</td>
</tr>
<tr>
<td>6</td>
<td>Engagement of Consultant for EIA Preparation</td>
<td>1 mon</td>
</tr>
<tr>
<td>7</td>
<td>EIA Preparation</td>
<td>2 mons</td>
</tr>
<tr>
<td>8</td>
<td>EIA Finalized</td>
<td>0 mons</td>
</tr>
<tr>
<td>9</td>
<td>Receive ECC from DOE</td>
<td>0 mons</td>
</tr>
<tr>
<td>10</td>
<td>Project Financing</td>
<td>3.5 mons</td>
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<tr>
<td>11</td>
<td>Financier's Preliminary Due Diligence and Appraisal of Project</td>
<td>1 mon</td>
</tr>
<tr>
<td>12</td>
<td>Submit Formal Application for Funds</td>
<td>0 mons</td>
</tr>
<tr>
<td>13</td>
<td>Financier(s) review of Loan Documents</td>
<td>1 mon</td>
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<tr>
<td>14</td>
<td>Negotiate with Financiers (loan conditions, interest rates, syndication etc.)</td>
<td>0.5 mons</td>
</tr>
<tr>
<td>15</td>
<td>Finalisation of the Financing Agreements</td>
<td>1 mon</td>
</tr>
<tr>
<td>16</td>
<td>Loan Agreement Signed</td>
<td>0 mons</td>
</tr>
<tr>
<td>17</td>
<td>Detailed Design</td>
<td>2.5 mons</td>
</tr>
<tr>
<td>18</td>
<td>Prepare Master Plan</td>
<td>1 mon</td>
</tr>
<tr>
<td>19</td>
<td>Prepare Detailed Design and Engineering Drawings</td>
<td>1 mon</td>
</tr>
<tr>
<td>20</td>
<td>Cost Estimates, BoQ and Technical Specifications</td>
<td>1 mon</td>
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<tr>
<td>21</td>
<td>Detailed Design completed</td>
<td>0 mons</td>
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<tr>
<td>22</td>
<td>Construction Phase</td>
<td>35.05 mons</td>
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<tr>
<td>23</td>
<td>Engagement of Construction Contractor</td>
<td>3 mons</td>
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<tr>
<td>24</td>
<td>Construction of Internal roads</td>
<td>3 mons</td>
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<tr>
<td>25</td>
<td>Development of on-site Utilities &amp; Infrastructure</td>
<td>3 mons</td>
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<tr>
<td>26</td>
<td>Construction of MTB and other Facilities as per Master Plan</td>
<td>26 mons</td>
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<td>27</td>
<td>Initial Promotion and Marketing for Space rental</td>
<td>32 mons</td>
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<tr>
<td>28</td>
<td>COD (Built-up Space of MTB ready for rental)</td>
<td>0 mons</td>
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</tbody>
</table>

**Timeline Diagram:**

- Project milestones and timeframes are indicated with icons and dates.
- The schedule includes key tasks and their corresponding durations.

**Notes:**

- The diagram visually represents the project timeline, highlighting critical phases and milestones.
- Specific dates and milestones are annotated to provide a clear understanding of the project's progression.

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**Source:** Feasibility Study for Jessore Software Technology Park

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**Page Number:** 214
### Indicative Implementation Schedule

#### Development of ICT Village at Jessore

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
<th>Jan</th>
<th>Feb</th>
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<th>Dec</th>
<th>Jan</th>
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<tr>
<td>1</td>
<td>Feasibility Study Completed</td>
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<td>Receive ECC from DOE</td>
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<td>Submit Formal Application for Funds</td>
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<td>13</td>
<td>Financier(s) review of Loan Documents</td>
<td>1 mon</td>
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<td>14</td>
<td>Negotiate with Financiers (loan conditions, interest rates, syndication etc.)</td>
<td>0.5 mons</td>
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<td>15</td>
<td>Finalisation of the Financing Agreements</td>
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<td>16</td>
<td>Loan Agreement Signed</td>
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<td>17</td>
<td>Detailed Design</td>
<td>2.5 mons</td>
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<td>18</td>
<td>Prepare Master Plan</td>
<td>1 mon</td>
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<td>19</td>
<td>Prepare Detailed Design and Engineering Drawings</td>
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<td>20</td>
<td>Cost Estimates, BoQ and Technical Specifications</td>
<td>1 mon</td>
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<td>Detailed Design completed</td>
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<td>22</td>
<td>Construction Phase</td>
<td>35.05 mons</td>
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<td>23</td>
<td>Engagement of Construction Contractor</td>
<td>3 mons</td>
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<td>24</td>
<td>Construction of Internal roads</td>
<td>3 mons</td>
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<td>25</td>
<td>Development of on-site Utilities &amp; Infrastructure</td>
<td>3 mons</td>
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<td>26</td>
<td>Construction of MTB and other Facilities as per Master Plan</td>
<td>26 mons</td>
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<td>27</td>
<td>Initial Promotion and Marketing for Space rental</td>
<td>32 mons</td>
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<td>28</td>
<td>CCD (Built-up Space of MTB ready for rental)</td>
<td>0 mons</td>
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Conclusions and Recommendations
14 CONCLUSIONS AND RECOMMENDATIONS

The outcomes of the feasibility study indicate that development of ICT Village at Jessore will be financially viable if the project is implemented under government led model. But the O&M outsourcing model will be the preferred implementation option, although the financial model has been prepared on government led model as the base case.

The study concludes that the decision of the government for the development of an ICT Village at Jessore is worthwhile and beneficial to the country. The salient conclusions and recommendations are provided below:

14.1 Financial Returns (Based on Urban Habitat Layout)

- The financial analysis shows that investment in the project will provide a return of 11.92% and a return of 11.50% on equity.
- It will take 15 years for investment payback, with equity payback occurring in 20 years.
- Overall, the financial analysis of the base case indicate that the project will be financially viable for implementation by the Government.

14.2 Demand Projection

- A total of three scenarios were developed to make demand projection on space take-up.
- Given the smaller growth centres in the region, the demand for space of 64,200 sft will be filled up within 7 years in base case, 5 years in optimistic case and 10 years in conservative case.

14.3 O&M

- If the project is implemented through the preferred option by outsourcing operation and maintenance of the project, the government can transfer operating risks to O&M operator.

14.4 Environmental and Social 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.
- The supervision consultant will monitor the project during construction phase to ensure that the construction of the project does not create adverse environmental impact in the area.

14.5 Promoting ICT–based Entrepreneurship

- As is evident from the market survey that a small number of software development companies are operational at Jessore and local demand for ICT based service is very low.
It is imperative to promote ICT based entrepreneurship by providing support to early-stage start-ups. As part of promotional activities, it is necessary to create awareness among the general public about the ICT Village specifically its functions and facilities.

It is highly recommended to construct immediately the data center in the core business facilities in the ICT Village. The data center should have collocation as well as shared-service facility to grow and attract specifically BPO companies/ start-ups to start business with minimal set-up. As conformance to good practice, emphasis should be given to ensure that it fulfils all the criteria of Tier level III standards.

A single window/one-stop service mechanism should be implemented for providing all benefits, concessions & permits, as well as all required statutory approvals to IT companies. A clearance agency with a physical presence in the ICT Village would facilitate the service in coordination with other Ministries, agencies and departments. Thus, delays on account of clearance/regulatory processes will be minimized.

**14.6 Digital Library**

To provide better access to electronic resources and reference study materials, a digital library should be established. It can be built by increasing the floor area of the single-storey Public Library situated in the immediate vicinity of the project site.

**14.7 ICT Business Ecosystem**

The authority may create an incubation ecosystem forming partnership with centres of excellence and IT industry body.

It may adapt institutional arrangements by entering into a tripartite partnership with BHTPA as the executing agency, Jessore Science & Technology University (JSTU) as the centre of excellence and BASIS as the industry body for the ICT sector.

Considering the long construction time and small industry size at Jessore, BHTPA can set up the incubator at rented facility in a cost effective way rather than constructing a new one and may continue its operation there for about four years. By that time the proposed ICT Village will came into operation and consequently, the incubator can be relocated to the Village permanently.

In addition, it is highly recommended to ensure reliable supply of electricity and hi-speed internet connectivity. The authority should provide full support for the development of skilled workforce aligned with the IT-based service industry.