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USAID/BANGLADESH

COMPREHENSIVE PRIVATE SECTOR ASSESSMENT

June 2019

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Acknowledgements

We thank USAID/Bangladesh for commissioning the work to us and for extending the support to design, conduct, and deliver this study.

Our sincerest gratitude to four members of the Economic Growth Office of USAID/Bangladesh: Mr. Thomas Pope, Office Director, Mr. Kerry Reeves, Deputy Director, Mr. Peter Gauthier, Private Enterprise Officer, and Ms. Aklima Haque, Project Management Specialist, for their valuable feedback on the methodology and findings of this assessment.

Additionally, we want to especially thank the government nodal agencies, industry associations, private sector enterprises, and relevant sector experts who have shared their ideas and critical insights through interviews and consultation workshops.

Abbreviations

API	Active Pharmaceutical Ingredients
B	Billion
B2B	Business to Business
B2C	Business to Consumer
BACCO	Bangladesh Association of Call Center and Outsourcing
BAPA	Bangladesh Agro-Processors' Association
BASIS	Bangladesh Association of Software and Information Services
BBS	Bangladesh Bureau of Statistics
BCMEA	Bangladesh Ceramic Manufacturers and Exporters Association
BEPZA	Bangladesh Export Processing Zone Authority
BEZA	Bangladesh Economic Zone Authority
BIDA	Bangladesh Investment Development Authority
BIDS	Bangladesh Institute of Development Studies
BIPET	Bangladesh Institute of Plastic Engineering and Technology
BITAC	Bangladesh Industrial and Technical Assistance Center
BPDB	Bangladesh Power Development Board
BPGMEA	Bangladesh Plastic Goods Manufacturers and Exporters Association
BPO	Business Process Outsourcing
BRTA	Bangladesh Road Transport Authority
BTB	Bangladesh Tourism Board
BUET	Bangladesh University of Engineering and Technology
BUILD	Building Initiative Leading Development
CAGR	Compound Annual Growth Rate
CBU	Completely Built Up
CETP	Central Effluent Treatment Plant
CKD	Completely knocked-down
COEL	Centre of Excellence for Leather Skill Bangladesh Limited
CSR	Corporate Social Responsibility
DCCI	Dhaka Chamber of Commerce & Industry
DFQF	Duty free and Quota free
DFQF	Duty Free Quota Free
ECNEC	The Executive Committee of the National Economic Council
EDSO	Environment and Social Development Organization
EE	Energy Efficiency
EHR	Electronic Health Records
EMA	European Medicine Agency
EPB	Export Promotion Bureau
ESF	European Social Fund
FAO	Food and Agriculture Organization
FBCCI	Federation of Bangladesh Chambers of Commerce and Industry
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
FTE	Fixed Time Equivalent
FY	Fiscal Year
GDP	Gross Domestic Products
GoB	Government of Bangladesh
GSMA	Global System for Mobile Communications Association
GSP	Generalized System of Preference
HACCP	Hazard Analysis and Critical Control Points

HDPE	High-Density Polyethylene
HH	House-hold
HIS	Hospital Information System
ICT	Information Communication and Technology
IPP	Independent Power Producer
IT	Information Technology
ITES	Information Technology Enabled Services
KII	Key Informant Interview
KPO	Knowledge Process Outsourcing
KW	Kilo Watt
kW-h	Kilowatt Hour
LC	Letter of Credit
LDC	Least Developed Country
LDPE	Low-Density Polyethylene
LEED	Leadership in Energy and Environmental Design
LFMEAB	Leather goods and Footwear Manufacturers and Exporters Association of Bangladesh
LFS	Labor Force Survey
LGRD	Local Government for Rural Development
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LWG	Leather working Group
M	Million
MAC	Middle and Affluent Class
MCCI	Metropolitan Chamber of Commerce & Industry, Dhaka
MNC	Multinational Companies
MoI	Ministry of Industries
MOU	Memorandum of Understanding
MSME	Micro, Small and Medium Enterprise
MW	Mega Watt
NTB	Non-tariff Barriers
POA	Probable Opportunity Area
PPP	Public Private Partnership
PPP	Purchasing Power Parity
PV	Photovoltaics
PVC	Polyvinyl Chloride
PwD	People with Disability
RMG	Ready Made Garments
SEIP	Skills for Employment Investment Program
SKD	Semi knocked-down
SME	Small and Medium Enterprises
SoW	Scope of Work
SREDA	Sustainable and Renewable Energy Development Authority
SWOT	Strength Weakness Opportunity Threat
T-2	Tier 2
TIB	Transparency International Bangladesh
TSD	Toy Safety Directive
U5	Under Five
USDA	United States Department of Agriculture
USFDA	United States Food and Drug Administration
VAT	Value Added Tax

WHO	The World Health Organization
WTO	The World Trade Organization
WTTC	World Travel and Tourism Council

Executive Summary

Private sector-led economic growth is pivotal for accelerating the growth of Bangladesh and helping Bangladesh become a middle-income country by 2021 and a high-income country by 2041. The country's export portfolio suffers from single-sector dependency on Ready-made Garments (RMG) which exposes the economy to exogenous shocks, alternative sectors with a vibrant private sector presence are more nascent and yet to experience transformational growth. Systematic diversification towards productive, value-added, and export-oriented sectors can address the current state of unemployment and catalyze inclusive growth. Hence, this report aims to provide a comprehensive assessment of 16 priority sectors[1], outside of the RMG industry, and identify relevant private sector engagement strategies in line with sectoral challenges and opportunities. The assessment methodology comprised of qualitative research tools such as desk research, primary interviews with private sector entities, industry associations, think tanks, and government nodal agencies, and field missions in selected small and medium enterprise (SME) clusters across key economic regions of Bangladesh. A multi-sector stakeholder consultation workshop was also arranged to extract strategic insights and validate the research findings.

The assessment has been designed to have a rigorous analysis on 16 priority sectors, which together contribute over six million jobs and close to $50 billion revenue from the domestic and international markets annually in Bangladesh. The majority of the sectors are on a fast-paced growth trajectory, exhibiting double-digit growth annually. A burgeoning middle-income class with increased purchasing power is driving domestic consumption, yet ensures low-cost labor in the international market, which is creating price-competitiveness. The sectors playing a vital role in Bangladesh economy such as agri-business, ceramic, plastic, and leather are gradually upgrading along the value ladder with the increasing presence of processing factories, dynamic leadership of local entrepreneurs, and technology-knowledge transfer from global investors. Sectors having backward or forward linkage connectivity between their supply chains, such as automotive and light engineering, are leveraging mutual complementarity to increase domestic value addition. Few sectors such as shipbuilding and pharmaceuticals have brought about a paradigm shift by launching world-class factories and maintaining globally acceptable product quality. On the other hand, sectors such as medical equipment, renewable energy, and information, communication, and technology (ICT) are at a more nascent stage of growth but have the potential to rapidly transform the local business landscape. On the contrary, few sectors are also facing critical challenges, as evidenced by stagnant revenue and employment generation. The telecom sector has experienced sluggish growth in the face of rapid digital disruptions and an unfavorable regulatory regime. Healthcare, one of the most high-impact sectors, has been beset with infrastructural limitations as well as weak governance framework. The shrimp sector is in dire need of a sector-wide overhaul with the emergence of highly competitive and better equipped export peers.

The assessment team has applied a sector analysis framework to select the most important sectors in terms of economic growth of Bangladesh from among those 16 priority sectors, as well as considering the intervention of USAID/Bangladesh, which can trigger accelerated and inclusive growth. The framework, comprising of nine factors and 24 sub-factors, was used to score all the priority sectors against two broad thematic areas: business potential and inclusion potential. Upon completion of the assessment, agribusiness (food processing), light engineering, ICT and outsourcing, tourism, pharmaceuticals, and healthcare were the six sectors recognized as the key sectors to support sustainable economic growth in Bangladesh and for future USAID intervention. The six selected sectors together contribute approximately 10 percent of the country's GDP while generating around 3.5 million jobs. Having ensured strong and steady market fundamentals, these sectors are poised to earn more than $60 billion at the end of 2023. In line with this, agribusiness (food processing) is thriving on a strong base of domestic backward linkage while generating around $4.8 billion in the last fiscal year. The food processing sub-sector alone contributes approximately 300,000 jobs and the sector is highly inclusive of the unskilled and female labor forces. In coherence with the *Digital Bangladesh* vision of the current government, the ICT and outsourcing industry earned $1.7 billion in the last fiscal year while creating around 940,000 jobs. The tourism industry, registering a robust annual revenue of $5.3 billion last year, is currently

[1] **Sixteen selected sectors**: 1. Agri-business, 2. Automotive/Truck/ Buses Assembly, 3. Ceramics. 4. Entrepreneurship, 5. Health Care, 6. ICT and Outsourcing, 7. Leather and Leather Goods, 8. Light Engineering, 9. Medical Equipment, 10. Pharmaceuticals, 11. Plastic, 12. Renewable Energy and Energy Efficiency, 13. Ship Building, 14. Shrimp and Fish, 15. Telecommunications and 16. Tourism.

boasting around seven million domestic travelers per annum. The light engineering industry, standing at $3.1 billion, has the highest multiplier impact potential as it is the backward linkage vertical[2] for almost all production and manufacturing sub-sectors. Bangladesh is the only LDC (least developed country) economy featuring a well-developed pharmaceuticals sector which has earned $2.5 billion in the last fiscal year, generating approximately 170,000 white-collar jobs. The healthcare sector is expected to reach more than $11 billion in annual revenue by 2023 if private sector actors can address the long-standing growth barriers including infrastructure gap and the severe shortage of medical professionals. The assessment team has also identified the key challenges and investment opportunities (for USAID) for each of the six selected sectors as provided below:

Agribusiness

Challenges/need for development
- Inadequate lab infrastructure and testing facility to carry out required quality control inspections for domestic as well as export markets. - Presence of adulteration in processed food is causing quality deterioration and public health concern. - High post-harvest loss owing to the lack of processing, storage, and packaging facilities. - High import-dependency for selected backward linkage components such as packaging, wrappers, and machinery.
Recommendations for USAID/Bangladesh
Opportunities for interventions with the private sector - Although the food processing sector has the highest value addition potential with regard to nutrition interventions, private sector actors are still at a nascent stage of designing business strategies embedding nutrition component. Intervention can be designed by targeting nutrition-specific and nutrition-sensitive stakeholders. - Facilitate the promotion of local products in the international market by helping the private sector attain international certifications and standards. - Engage with the large agro-processing farms as an aggregator to get access to local SMEs, contract framers and design program in improved farming methods, pesticide usage and post-harvest storage techniques. - Design technical and capacity building programs for farmers and MSMEs in hard-to-reach areas to get connected with e-commerce players.

Healthcare

Challenges/need for development
- Bed density per thousand people is below the global standard (stands at 0.9 against global average of 2.7). Workforce density (doctors, nurses and midwives) is also standing below the WHO benchmark. (7.4 per10,000 populations against WHO benchmark of 44.5 per 10,000 population). - OOP private financing is at 63 percent against the global average of 32 percent and 93 percent of the private expenditure is paid by out-of-pocket savings of the people. - Lack of confidence in local healthcare professionals causes 3.5 billion medical-tourism expense across India, Thailand, Singapore, and Malaysia by 700,000 Bangladeshi people each year.

[2] When the raw materials or input materials of one industry comprise of the final outputs produced through another industry; the second industry is the backward linkage vertical for the first one.

Recommendations for USAID/Bangladesh
Opportunities - Integrate existing *Smiling Sun* network with large private hospitals to act as a remote center for providing first-class healthcare service in the rural market. - Technical support to provide comprehensive healthcare sector waste management. - Accelerate partnership with medical teaching colleges to provide internationally accepted accreditation for healthcare professionals. - Launch accreditation/certification platform having joint representation from both public and private stakeholders to ensure standardized and improved service across different hospitals, clinics, diagnostics centers. - Conduct feasibility research to assess the opportunity to launch health insurance by SMC Enterprise for the peri-urban and rural market. - Expand Niltara intervention of SMC particularly the diagnostic component by equipping it with modern lab facilities and by scaling up beyond Dhaka. - Promote nutrition-sensitive interventions at industrial clusters/workplaces via RMG/leather/plastic industry associations.

ICT and outsourcing

Challenges/need for development
Challenges/need for development - Low-level of awareness of 'Bangladesh' as an IT offshoring destination in the global market. - Limited facility of world-class IT infrastructure, only two hi-tech parks are currently operational whereas the majorities are in the planning phase. - Intellectual property (IP), data privacy and digital security ecosystem are less favorable for IT-ITeS market compared to top offshoring countries like India and the Philippines. - Higher cost of Internet bandwidth deterring sector competitiveness. - Upskilling and reskilling of the youth by revamping the outdated curriculum.
Recommendations for USAID/Bangladesh
Opportunity for interventions with the private sector - Policy advocacy for IT-focused labor law. - Organize matchmaking events with foreign counterparts. - Work with leading BPO companies such as KaziIT, Graphic people, Genex to expand their operations in tier two cities (Jashore, Sylhet, Rajshahi). - Prepare ICT centric skill development courses in pre-existing college and universities and skill development of tier-2 cities to ensure decentralized job opportunities.

Light engineering

Challenges/need for development
- Old or second-hand machinery parts and tools limit the quality of design and finish of the products decreasing their quality and competitiveness. This impacts quality, consistency and productivity. - Around 90 percent of enterprises are micro or small, informal in nature - this decreases their bankability from traditional financial institute perspective. This also often means salaries are low and the Government is unable to tax revenue. - Low-grade raw material with no testing facility is causing lower growth in export earnings. - Industry has no Common Facility Centre (CFC) and there is a lack of metal and heat treatment facilities.
Recommendations for USAID/Bangladesh
Opportunity for interventions with the private sector - Initiative to train MSME entrepreneurs in financial due diligence. - Inspire employers to ensure decent work opportunities offering fair income for the grassroots level workers.

- Facilitate collaboration with interested foreign counterparts for catalyzing adoption of compliant business process, technology upgradation and knowledge transfer.

Pharmaceuticals

Challenges/need for development

- High import dependency for raw materials resulting in high vulnerability to external shocks.
- Absence of bioequivalence testing lab.
- Lack of skilled manpower for clinical and biotechnology research.

Recommendations for USAID/Bangladesh

Opportunity for interventions with the private sector

- Partnership with the pharmaceutical industry association to address AMR (Antimicrobial Resistance): launch a nationwide campaign with a view to raising awareness about 'Superbugs'[3], about how self-medication/ unauthorized medication of antibiotics can lead to death.
- Partnership with the government of Bangladesh to:
    - Strengthen laboratory capacity so that research on AMR prevalence and outbreak can be tracked locally/efficiently.
    - Advocacy to create a regulatory framework which takes strict actions against the counterfeit or poor quality of antimicrobial medicines and enforces OTC drug sales monitoring and surveillance.
- Continuous support for getting quality assurance certification to tap into highly regulated markets like the USA and EU.
- Establishment of a common facility center is necessary for Bangladesh which will able to deliver/process clinical data and develop medicines.
- Initiate partnership with universities for research and experiment for new vaccines and medicines.

Tourism

Challenges/need for development

- Lack of advertisement efforts focusing on international target audiences such as budget-travelers, adventure-tourists and faith-based tourists (religious tourism).
- Unplanned tourism infrastructure harming biodiversity and natural environment.
- High VAT and taxes hindering the growth of small and medium-size hotels and resorts in the tourism sites.

Recommendations for USAID/Bangladesh

Opportunities

- Initiate dialogue with the government to reform tax and VAT policy.
- Initiate training, skill development, and develop market strategies, R&D, and innovative ideas of promotions for creating demand.
- Facilitate local handicraft sector as a boutique idea to attract foreigners and improve visitors export.
- Facilitate tourist ventures promoting community tourism at remote/traditionally excluded regions.

The assessment team has identified sectoral barriers and sector-specific recommendations for each of the 16 priority sectors. It is highly recommended that USAID/Bangladesh prioritizes engagement with the relevant stakeholders of the six selected sectors in line with the customized recommendation strategies and considers the findings of this deep dive assignment for designing future program strategies. In addition to sector-specific challenges, this study has also identified a number of cross-cutting barriers or common problems which are restricting the private sector from reaching their optimum potential. Lack of access to low-cost financing, a dearth of skilled workers and mid-level managers, entry barriers to access emerging export destinations, lack of compliance initiatives throughout different value chains and absence of data-driven sectoral growth roadmap- all of these challenges characterize the general business landscape of

[3] Overuse and misuse of antibiotics has prompted some strains of bacteria to make a small change in their DNA and become antibiotic-resistant "superbugs".

Bangladesh. USAID/Bangladesh can help the private sector in addressing these challenges by collaborating with region-specific chambers of commerce or sector-specific business associations. Special focus can be provided on the micro, small and medium enterprises (MSMEs) with a view to promoting awareness about the business benefits for maintaining compliance best practices. Capacity building of sectoral associations with adequate knowledge on policy and advocacy process can also be an important action item for realizing a healthy public-private nexus. In addition to these, USAID can engage with local business conglomerates in facilitating the adoption of *strategic philanthropy* or *strategic CSR* projects in coherence with the sustainable development goals (SDGs). Engagement with such overarching, multi-sectoral challenges will trigger better *value for investment* for the limited USAID/Bangladesh funding.

PART A

Background

1 Part A: Background

1.1 Objective of the assignment

1.1.1 Primary objective

The primary objective of the study is to identify emerging investment opportunities beyond the RMG sector through a comprehensive private sector assessment of the selected 16 industry verticals (sectors).

1.1.2 Specific objectives

1. To identify sectoral achievements, limitations, opportunities, and availability of resources through analyzing the domestic market and its value chain.
2. To identify sectoral outward orientation by analyzing the current & potential future export dynamics.
3. To identify the sectoral impact on human capital accumulation through analyzing current and future employment.
4. To identify inclusion potential of excluded and marginalized social cohorts such as gender diverse communities, people with disabilities (PwD), ethnic minorities, & unskilled workforce.
5. To identify the sectoral positive or adverse impact on the environment and its ecosystem.
6. To develop a "*Comparative Sector Assessment Framework*", that will guide to identify potential sectors.
7. To identify a cluster of sectors that possesses inclusive and sustainable growth potential.

1.2 Methodology

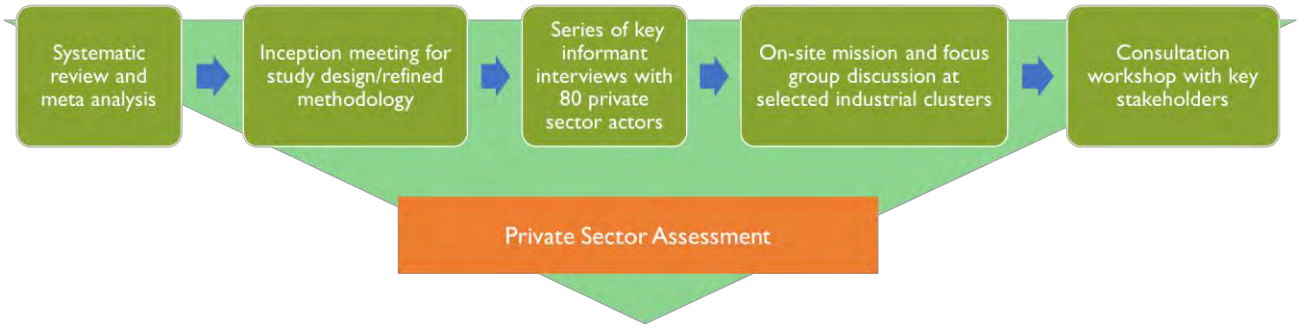


Figure 1: Visualization of the methodology for the assessment

The figure above illustrates the steps of the methodology used in the assessment. The analysis done in the report was based on qualitative research driven by key informant interviews with industry insiders and private sector actors. The information retrieved from the interviews was further validated through three layers of additional stakeholders: selected industry associations, government nodal agencies, and policy think tanks. A detailed overview of the step-by-step methodology has been illustrated below:

- **Systematic review and meta-analysis:** Meta-analysis comprised of desk-review on existing research findings, relevant sectoral documents, industry roadmap, policy papers, and other secondary literature in accordance with the project objectives.
- **Inception meeting with USAID/Bangladesh:**
    - Clarification of the study methodology was done for a comprehensive on-boarding of all stakeholders.
    - Instantaneous feedback was collected to refine the study approach.
    - A common understanding was outlined for sectoral priority and how current projects individually and collectively address various aspects of private sector engagement.
- **Conduction of series of *Key Informant Interviews* (KII) with industry stakeholders:**

  Informants from four cohorts of companies were selected from each sector:

I. Cohort A: Large enterprises with global value chain integration (supplier/exporter of foreign buyers)
II. Cohort B: Medium-sized enterprises with regional/national trading relationship
III. Cohort C: Small-sized companies with early-stage growth dynamics
IV. Cohort D: Innovators with disruptive technology or process innovation

Interviewee Personnel	**N**	**Remarks**
Private sector stakeholders	55	• Large and medium enterprises coming from the 16 industry verticals • Small enterprises and startups in emerging industries
Sector-specific associations and think tanks	15	• Associations representing nine sectors • Chambers of commerce from Dhaka, Chattogram, and Rangamati • Think Tanks: BUILD, Center for Energy Research, UIU
SME cluster and field visit	6	Dhaka, Chattogram, Cox's Bazar, Khulna, Jashore, Satkhira
Government nodal agencies	9	Ministry of Commerce | PPP Office | BEPZA | BIDA | BEZA | SREDA
Total	**85**	

A list of all respondents/informants for this assignment has been appended in the annex

SME cluster visit: The objective of cluster visit was to reach out and conduct discussion sessions with grassroots level entrepreneurs across key economic hotspots of the country. Four on-site missions (field visits) were conducted as mentioned below:

- **Bogura:** Two discussion sessions were arranged in Bogura in presence of association leaders, representatives of local government bodies, SME entrepreneurs.
- **Khulna and Shatkhira:** Four discussion sessions were conducted in a cohort of value chain actors for Shrimp sector.
- **Jashore:** One discussion session was conducted in Jashore IT park in presence of a few regional IT entrepreneurs.
- **Chattogram:** Four discussion sessions were conducted with stakeholders from light engineering, shrimp and shipbuilding sector.

Consultation workshop: A consultation workshop titled "Diversified and inclusive private sector development in Bangladesh" was held in presence of the USAID/Bangladesh Mission members, apex chamber bodies, sector-specific trade bodies, investment professionals, development sector bred veterans, and senior management personnel of key private sector companies. A keynote presentation was disseminated compiling the research findings with a view to collecting feedback/validation from the relevant audience cohorts.

1.3 Overview of domestic private sector

1.3.1 Bangladesh economy: diversification is the key to inclusive growth

Economic overview | Understanding the market fundamentals: Though Bangladesh was able to increase the average GDP growth rate by one percentage point for each decade since the 1990s, the country still remains as one of the less developed economies in the region. Looking exclusively over the last five years' horizon, the transformation story is unparalleled with an above seven percent average growth rate (Inspira Extrapolation, 2019). Inflation has remained moderate and public debt levels are low by world standards. Foreign direct investment inflow is growing at a compound annual growth rate **(**CAGR) of more than 8.9 percent (Inspira analyses 2019), while global FDI inflow has been experiencing close to 20 percent decline rate (UNCTAD, 2019). The remittance sent over by 10 million non-resident countrymen stands at 12 percent of the GDP in 2017-18, marking a positive trend with a 15 percent annual growth compared to the previous fiscal year (Bangladesh Bank, 2019). Although half of the population still live at the 'bottom of the pyramid', a young and growing working-age population, with a median age of 26.7 years, will provide a

strong base for rising consumption in coming decades. Economists estimate that 'Middle and Affluent Class' (MAC: Annual HH income of $5,000 or more) which is expected to grow with a CAGR of approximately 11 percent and reach 34 million domestic MAC market by 2025, buoyed by fast-paced urban growth across several cities, will create a growth-ripple on many industries (Boston Consulting Group, 2015). Although the export basket is still concentrated on RMG sector, soaring labor cost in China coupled with escalating international trade conflict is creating export-impetus of $400 million worth of additional export receipt by next year has been projected by ADB already (ADB, 2019). In a nutshell, the market fundamentals for economic growth are prevailing and ready to accelerate the parade towards middle-income country status.

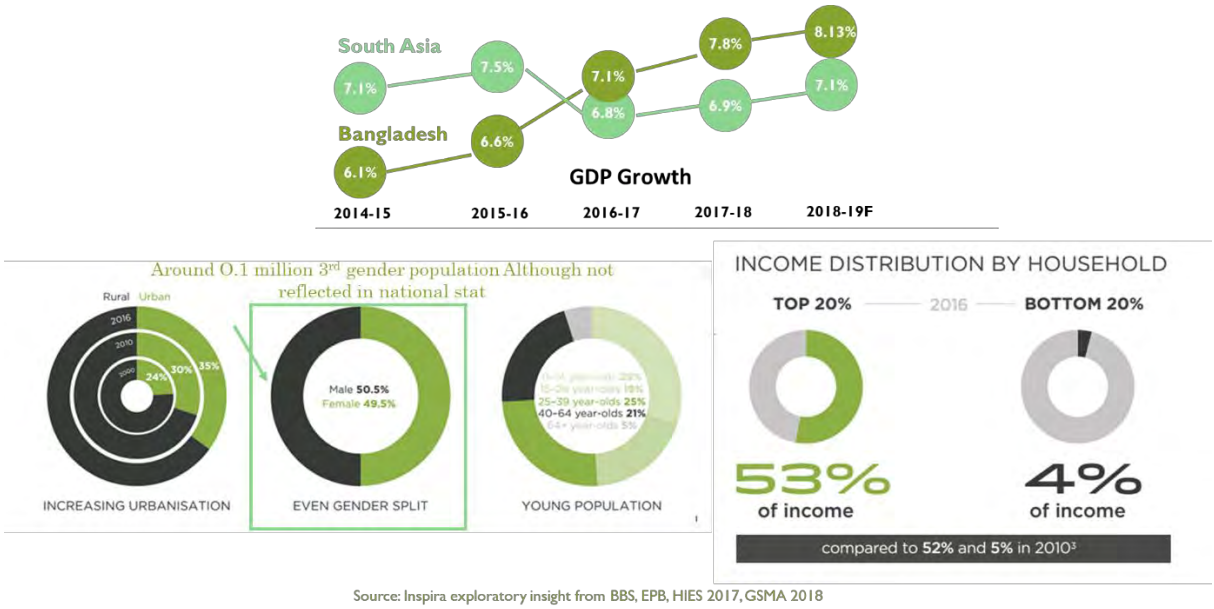


Figure 2: Macro-level indicators of the country's economy

Inclusive growth | A challenge yet to be tackled: Throughout the last five fiscal years, new jobs increased by only 0.9 percent per annum while the economy grew at a substantially higher rate of approximately seven percent. From the industrial growth perspective, the scenario is more concerning as manufacturing jobs declined by 770,000, an annual average decline by 1.6 percent throughout the timeline of 2013-2017 (SANEM, 2018). This has been catalyzed by a significant decline of female participation in the manufacturing labor force as evidenced by a big drop by 920,000 over the said period. Around 40 percent of the population aged between 15 and 24 years are classified as NEET (Not in Education, Employment or Training) at a time when every year 2.1 million people are entering the job market. There has not been much progress in terms of including the traditionally excluded social cohorts such as ethnic minorities (five million), people with disabilities (16 million), or gender diverse communities (less than 500,000) into the job market. All in all, with this backdrop of jobless growth across all social strata, wealth inequalities are escalating as the top five percent of the households possessed 28.9 percent of the national income while the bottom five percent possessed only 0.02 percent (ILO, 2019).

Journey ahead | Need for diversification: To become a developed country by 2041, Bangladesh needs to ensure an eightfold increase of per capita income within the next two decades. On the pathway, the first milestone will be to become a middle-income country by 2021. With the current pattern of stagnant job growth, the country needs to prioritize on outward orientation, i.e. export-led productive human capital accumulation, as successfully evidenced by other emerging economies worldwide. Table 1 the export matrix comparison within peer economies that reveals the extent of single sector dependency Bangladesh has been suffering.

Table 1: Comparison among Bangladesh and peer economies on top export category contribution

	Philippines	Pakistan	Bangladesh	Thailand	Vietnam	India	Indonesia
% of #Top Export category in Total Export	44.80%	18.10%	86.10%	17%	38.10%	14.4%	21.8%

As shown in Table 1, the RMG sector alone contributes 80 percent of Bangladesh's annual export which exposes our economy to threats of exogenous vulnerability. Therefore, it is imperative that Bangladesh reduces its single sector dependency and aims to identify a pool of alternative sectors, facilitate investment beyond RMG, and generate growth in those emerging areas of the economy which will lead towards inclusive and sustainable growth, eventually.

1.3.2 Private sector dynamics: a closer look at selected sectors

Over the past two decades, Bangladesh's private sector has been gradually looking beyond the local market and accessing global value chains by utilizing its competitive advantage. In addition to RMG, few other sectors have succeeded in the global market in securing a position such as leather and leather goods, pharmaceuticals, processed food, light engineering, and plastic. The overall investment-to-GDP ratio has increased in FY 2017-18, where public investment rose by 1.3 percent but private sector investment to GDP ratio did not increase as expected. The private investment-to-GDP ratio is hovering around 23 percent for last one decade but it needs to increase by five to six percent (to achieve the middle-income status), which requires $12.5 billion of additional investments each year (World Bank, 2019). A large portion of this additional private investment will have to come from FDI. While global FDI is declining at approximately 20 percent rate, FDI inflow in Bangladesh is growing year-on-year although it is concentrated on textile, power, telecommunications, and financial service sector.

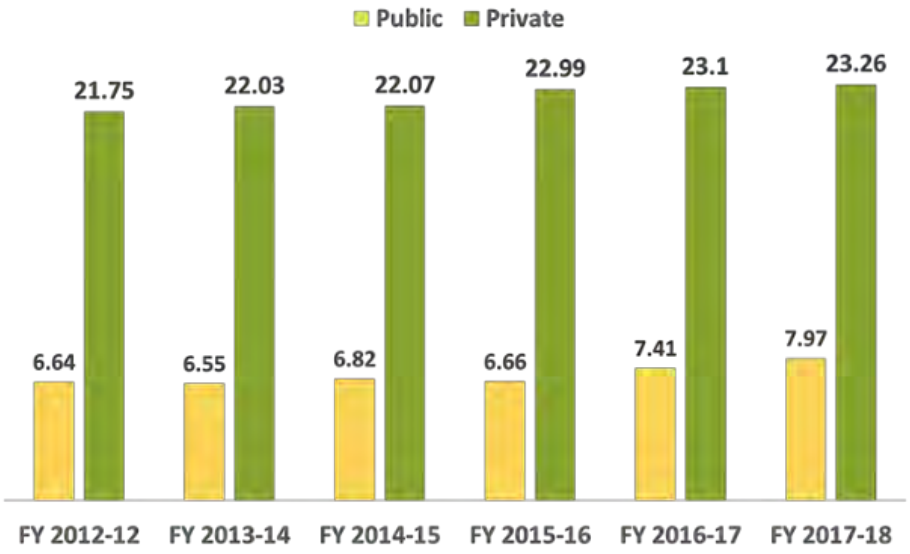


Figure 3: Investment-to-GDP ratio by public and private sector

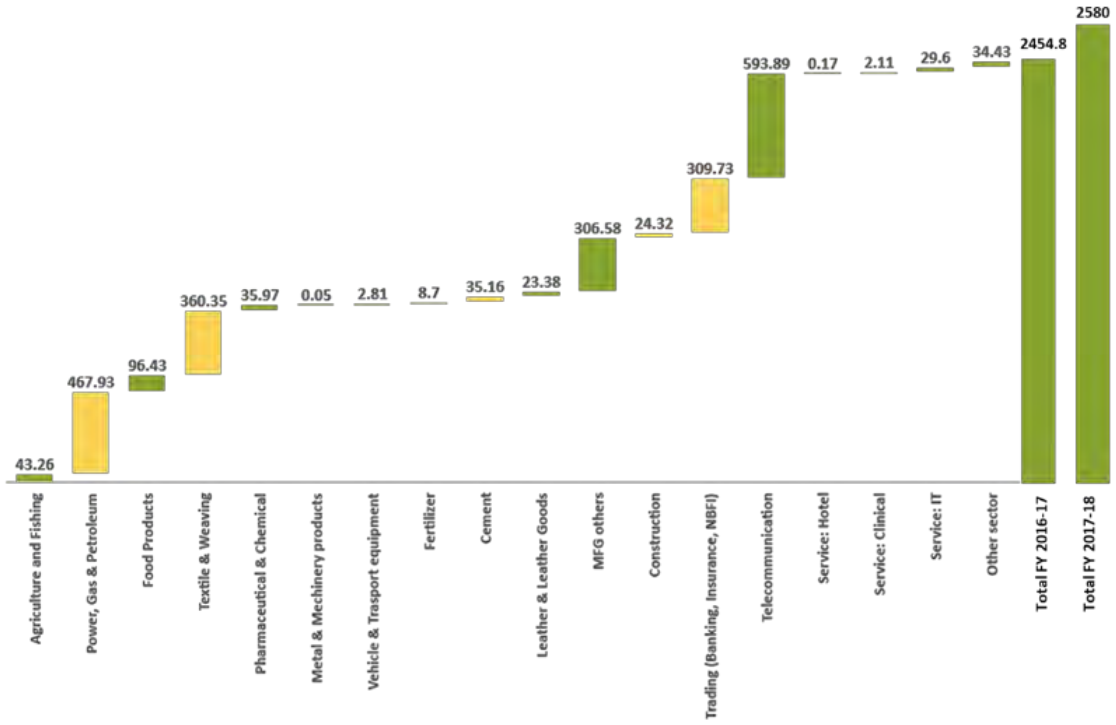


Figure 4: FDI inflow in FY 2016-17 (in million USD)

The economic geography of Bangladesh is concentrated on a growth triangle between Dhaka, Chattogram, and Khulna, known as the 'engine of growth'. Major industrial activities and axillary business services are based in these large cities. Dhaka, being the capital, commands the prime focus of major infrastructure reform projects and attracts a comparatively higher degree of industrialization. As the center of business gravity, it has an economic density of $55 million per sq. km. contributing up to approximately 35 percent of the national GDP (World Bank). After Dhaka, Chattogram became the second-largest economic hub driven by Chattogram port which is the gateway of the country's export-import activities. In addition to Dhaka and Chattogram, Khulna and Bogra have emerged as regional growth drivers in the last two years with the vibrant presence of private sector actors.

As per the SOW, USAID/Bangladesh has identified 16 sectors to assess and find potential sectors for future engagement. The identified sectors are also reflected in several development policies and vision documents of the Government of Bangladesh including Export Policy 2018-21 and the Industry Policy 2016. The map shown in the next page is the output where the presence of 16 sectors were identified and plotted and the illustration clearly reflects a carbon copy of economic geography explained above.

The map illustrates,
Growth Center: Dhaka (Presence of over 13 sectors)
Growth Drivers: Three districts (Presence of nine to 12 sectors in each district)
The Next Frontier: Ten districts (Presence of five to eight sectors in each district)

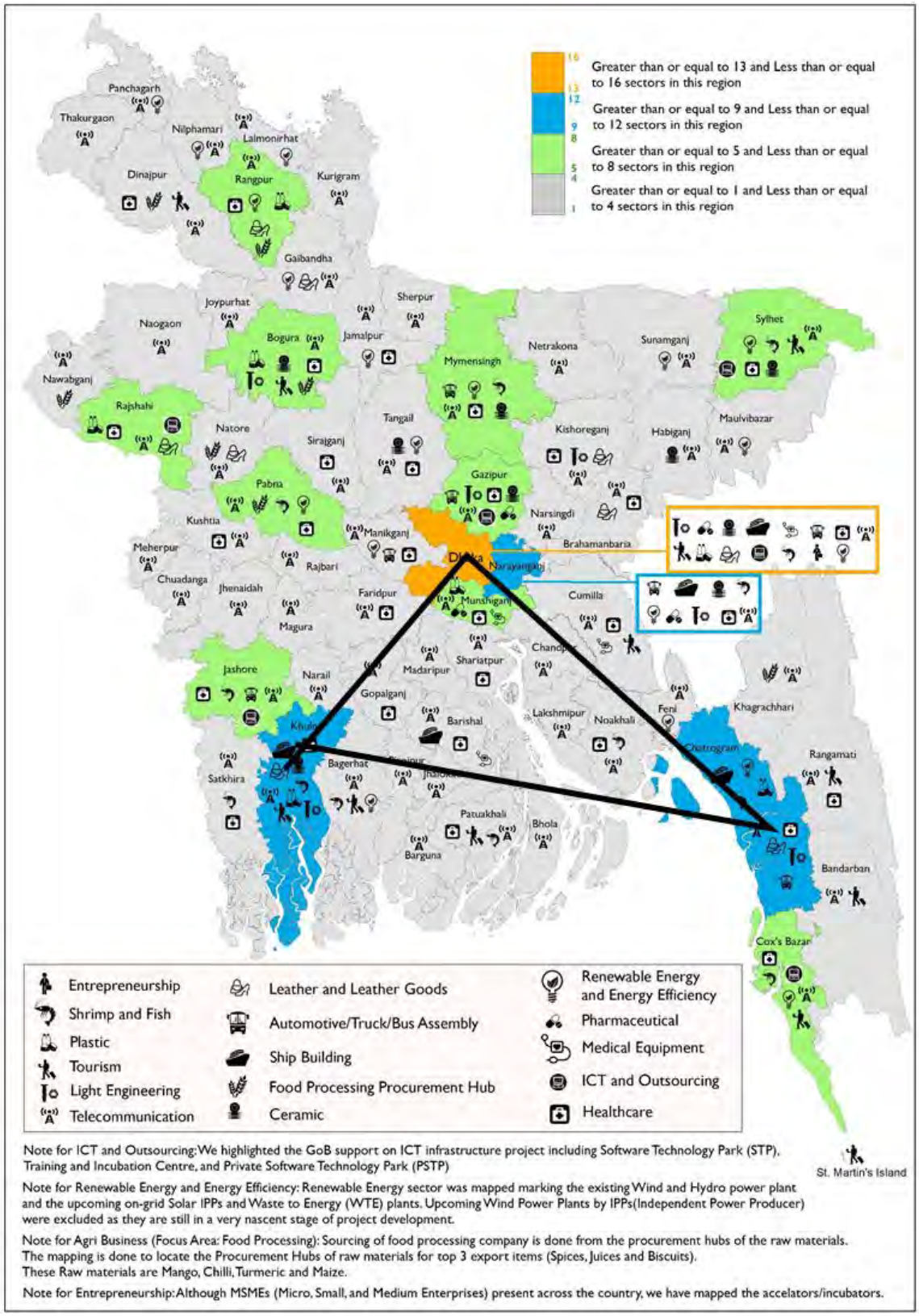


Figure 5: Private sector map of sixteen sectors given in the SOW

Note: Mapping indicates the presence of sectors only, does not indicate volume/value of activity in the sectors

PART B

Key findings

2 Part B: Key findings

2.1 Sector summary, challenges and key recommendations

Agribusiness (food processing): Rising dual-income households with increased purchasing power and changing the momentum of urbanization have transformed the structure of food value chains and the markets worldwide. In coherence with that, Bangladesh's agro-processing market has been growing at a rate of 15 percent for the last five years which is currently valued at approximately $4.81 billion including both domestic and export market. In FY 2017-18, the sector has fetched export earnings worth $635 million. With this positive growth trend, it can be estimated that the food processing sector is poised to reach $8.23 billion by 2023.

Challenges/need for development
- Inadequate lab infrastructure and testing facility to carry out required quality control inspections for domestic as well as export markets. - Presence of adulteration in processed food is causing quality deterioration and public health concern. - High post-harvest loss owing to the lack of processing, storage, and packaging facilities. - High import-dependency for selected backward linkage components such as packaging, wrappers, and machinery.
Recommendations for USAID/Bangladesh
Opportunities for interventions with the private sector - Although the food processing sector has the highest value addition potential with regard to nutrition interventions, private sector actors are still at a nascent stage of designing business strategies embedding nutrition component. Intervention can be designed by targeting nutrition-specific and nutrition-sensitive stakeholders. - Facilitate the promotion of local products in the international market by helping the private sector in getting international certifications and standards. - Engage with the large agro-processing farms as an aggregator to get access to local SMEs, contract framers and design program in improved farming methods, pesticide usage, and post-harvest storage techniques. - Design technical and capacity building programs for farmers and MSMEs in hard-to-reach areas to get connected with e-commerce players.
Probable partners - Bangladesh Agro-Processors Association (BAPA): Apex trade body of the food processing industry. - Oggro: Youth social enterprise working directly with smallholder farmers by connecting grassroots farmers with modern retail touchpoints (superstores). It also has the potential to disrupt traditional potato export processes by introducing value-added potato export in future. - M.M. Ispahani Ltd: First mover of exporting selected processed fruits (Jackfruit) to China. Planning to strengthen their export vertical of processed food/fruits by going beyond their core competency i.e. Tea. - Potential private sector (processed food) players who have started engaging in food fortification. ● ACI Limited: Launched rice bran oil under the brand 'ACI Nutrilife'. ● Abdul Monem ltd: Launched 'Nutricks Cup' ice cream enriched with nutrition under their brand Igloo Ice Cream. ● City Group: Launched rice bran oil in the domestic market. - Rangamati Chamber of Commerce and Industry: With the onset of bumper fruit yield throughout the last few years, Chattogram Hill Tracts has gradually become a key location for processing industries.

Automotive/truck/buses assembly: Although the industry was largely dominated by import driven CBU (Completely Built Up) vehicles even a decade ago, now the market leaders are gradually moving towards SKD (Semi Knocked Down) and CKD (Completely Knocked Down) facilities by partnering with foreign companies. The current domestic market size of automotive industry of Bangladesh is approximately $13.89 billion with an average positive CAGR of 21 percent in the last five years. For *motorcycle*, the current domestic market size is approximately $656 million which has been enjoying 32 percent average growth from 2015 to 2018. For *private car* segment, the current market size is approximately $6 billion with 15 percent positive CAGR. The *commercial vehicle* market size is approximately $7.2 billion with 16 percent CAGR from 2013 to 2017. To support the industry, approximately 5,000 employees are directly connected in the factory level work and 50,000 employees in the post-production (retailing, after-sales service, parts replacement service) process. With a similar growth trend, the industry is expected to reach $32 billion at the end of 2023.

Challenges/need for development
- Underdeveloped backward value chain (component vendors/light engineering enterprises) which does not allow shifting an industry from CBU to SKD or CKD. - Absence of adequate testing facilities hindering the attainment of standard certification.
Recommendations for USAID/Bangladesh
Opportunities for interventions with the private sector - Initiate one-stop testing lab solution for the manufacturers to test their products to ensure product quality and attain adequate certification. - Initiate and facilitate joint ventures to set up commercial charging stations for EV (Electric Vehicle) and provide technical support for conducting a feasibility study for charging station mapping across the country. - Policy research support as new policies on EV in Bangladesh will go through multi-ministerial complexity.
Probable partners - Runner Motors: first Company to have an export footprint in the automotive industry. Besides they have ensured the highest level of local value addition in motorcycle manufacturing. This indicates that they have higher employment generation potential compared to other players. - Nitol Motors: Planning to launch the first assembly plant for electric cars in Bangladesh. - PHP Group: Launched the first car assembly plant in Bangladesh in association with Proton Malaysia.

Ceramic: In the last decade, the growth momentum of the ceramic industry has achieved different milestones in both endogenous and exogenous market. The journey of the industry in this delta has begun in the 60s and currently has accumulated an investment worth $1,051.77 million. After crossing six decades of journey, as per FY 2017-18, the value of the domestic market size is $668.54 million while the export size is $52 million. Recently, the government has declared 10 percent cash incentives on ceramic items export. Ensuring 40 percent female enrollment in the total workforce of the industry, it is now employing a workforce totaling 48,000 workers. The trends and statistics are indicating that the industry will attain a value worth $1.56 billion by 2023.

Challenges/need for development
Challenges/need for development - Disrupted gas supply results in the inefficient production process. - High import dependency for the key raw material. - Inefficient transportation and shipment facilities increase production lead time and slow down the manufacturing process.
Recommendations for USAID/Bangladesh
Opportunities for interventions with the private sector - Policy advocacy to ensure uninterrupted power and gas supply to the factories. - Launching a central platform for product design and innovation. - Support in research and development for catalyzing the production of advanced ceramic products (ex. ultra-lightweight, heat-insulating ceramic fiber).
Probable partners - Bangladesh Ceramic Manufacturers and Exporters Association (BCMEA): Apex trade body of the ceramic industry. - Monno Ceramic Industries Ltd: High export market presence in over 27 countries across the globe.

Healthcare: The first two decades of Bangladesh healthcare sector (after independence) was solely driven by public intervention and foreign aid. Economic reformation in the 1990s opened the door for private investment in the healthcare sector. In 2017, the total size of the healthcare market stood at $5.9 billion, accommodating close to 170,000 registered health professionals (physician, diploma nurse, BSc nurse, and medical technologist) whereby physician, nurse, and medical technologist ratio was 1:0.6:0.4, which is evidently different than the international standard of 1:3:5. Health workers are concentrated in urban secondary and tertiary hospitals, although 70 percent of the population lives in rural areas. Limited infrastructure (skewed bed density and substandard equipment) coupled with a severe shortage of trained

professionals mark domestic healthcare sector, which is to say, private investment can address this gap while churning positive return on investment. Projections are indicating that the sector value is expected to reach beyond $11 billion by 2023.

Challenges/need for development
Challenges/need for development - Bed density per thousand people is below the global standard (stands at 0.9 against global average of 2.7). Workforce density (doctors, nurses and midwives) is also standing below the WHO benchmark. (7.4 per10,000 populations against WHO benchmark of 44.5 per 10,000 population). - OOP private financing is at 63 percent against global average of 32 percent and 93 percent of the private expenditure is paid by out-of-pocket savings of the people. - Lack of confidence in local healthcare professionals causes 3.5 billion medi-tourism expenses across India, Thailand, Singapore, and Malaysia by 700,000 Bangladeshi people each year.
Recommendations for USAID/Bangladesh
Opportunities - Integrate existing *Smiling Sun* network with large private hospitals to act as a remote center for providing first-class healthcare service in rural market. - Technical support to provide comprehensive healthcare sector waste management. - Accelerate partnership with medical teaching colleges to provide internationally accepted accreditation for healthcare professionals. - Launch accreditation/certification platform having joint representation from both public and private stakeholders to ensure standardized and improved service across different hospitals, clinics, diagnostics centers. - Conduct feasibility research to assess the opportunity to launch health insurance by SMC Enterprise for peri-urban and rural market. - Expand Niltara intervention of SMC particularly the diagnostic component by equipping it with modern lab facilities and by scaling up beyond Dhaka. - Promote nutrition-sensitive interventions at industrial clusters/workplaces via RMG/leather/plastic industry associations.
Probable partners In addition to SMC following organizations could be the probable partners, - AFC Health Fortis Heart Institute: Healthcare facility which specializes in NCD and planning to create a chain of hospitals across Bangladesh. - PRAAVA Health: Introduced the concept of family doctor (improved time and quality of doctor-patient consultation) with high-quality diagnostic testing lab (integrated with technology which allows universal access facility) under the same roof. - Mayalogy Limited: An online health and well-being platform serving in three categories (medical, psychosocial, and mental healthcare) with special focus on pregnant women. - CMED: A cloud-based smart monitoring system for regular health monitoring which minimizes the risk of non-communicable diseases and its prevention.

ICT and outsourcing: The Information and Communications Technology (ICT) and IT-enabled outsourcing in Bangladesh have been maintaining a double-digit growth rate over the last 10 years. The domestic market, standing at $1.1 billion as of FY 2017-18, is expected to have a CAGR of 34 percent (in the next three years) which is significantly higher compared to established peer locations such as India and the Philippines and even emerging peer locations such as Vietnam. The export has grown at the same pace as well and achieved a CAGR of 40 percent in the last five years. The government has set the target to reach export earnings of $7 billion by 2023 from this sector. Customized software is the main revenue driver in the domestic market and firms are also focusing on web service, application development, IT consulting. On the other hand, export earning is highly dominated by non-voice services and freelancers' earnings. According to BACCO, earnings from BPO (Business Process Outsourcing) sector stood at $300 million in FY 2017-18.

Since the government has a strong vision to accelerate ICT and Outsourcing sector, the sector is enjoying several fiscal and non-fiscal benefits such as 100 percent tax exemptions, 10 percent cash incentives, dedicated infrastructure, and innovation grants. As Bangladesh has the comparative advantage of 'lowest cost offshoring destination' in global outsourcing landscape (20-30 percent lower than India and Philippines), it has drawn attention from several leading global IT-ITES service providers such as Wipro, IBM, TCS, and Augmedix.

Challenges/need for development
Challenges/need for development - Low-level of awareness of 'Bangladesh' as an IT offshoring destination in the global market. - Limited facility of world-class IT infrastructure, only two hi-tech parks are currently operational whereas the majority is in the planning phase. - Intellectual property (IP), data privacy and digital security ecosystem are less favorable for IT-ITeS market compared to top offshoring countries like India and the Philippines. - Higher cost of Internet bandwidth deterring the sector competitiveness. - Upskilling and reskilling of the youth by revamping the outdated curriculum.
Recommendations for USAID/Bangladesh
Opportunity for interventions with the private sector - Policy advocacy for IT-focused labor law. - Organize matchmaking events with foreign counterparts. - Work with leading BPO companies such as KaziIT, Graphic people, Genex to expand their operations in tier two cities (Jashore, Sylhet, Rajshahi). - Prepare ICT centric skill development courses in pre-existing college and universities and skill development of tier-2 cities to ensure decentralized job opportunities.
Probable partners - BACCO: Apex trade body for BPO sector. - Digicon Technologies Limited: Leading inbound call center service provider of the country. - Graphic people Ltd: Leading ITES service exporter of the country. - Tiger IT Ltd: Country's leading ITES vendor in the SAARC region. - Genex Infosys Ltd: Leading BPO Company. - BASIS: Apex trade body for the ICT sector.

Leather and leather goods: Leather and leather goods industry is the second-largest export earning sector for Bangladesh after RMG with an export value of $1.08 billion in FY 17-18. The estimated domestic market stood at $1.9 billion during the same period with 13 percent year on year growth export size has decreased in the recent most fiscal year owing to absence of traceability compliance such as fully functional ETP (Effluent treatment plant) in the new tannery estate. There are approximately 3,500 SMEs, 90 large firms, and 15 big enterprises present in the value chain, employing around 200,000 directly and approximately 600,000 people indirectly. With positive growth in the domestic market and projected positive transformations in tannery estate, the industry is expected to reach $4.8 billion by 2023.

Challenges/need for development
- Partially operational Central Effluent Treatment Plant (CETP) leading to non-compliance with environmental regulations, occupational safety and health standards resulting in low acceptance of local leather in international markets. - Inefficiency in the procurement of raw material process damages hides and skins which hampers the overall quality and weak leather traceability.
Recommendations for USAID/Bangladesh
Opportunities for interventions with the private sector - Facilitate dialogue between tannery state authority and private entrepreneurs to expedite the solution of CETP problem. - Technical support for comparative price benchmark study with export peers such as India and Vietnam since

local entrepreneurs do not have much visibility regarding their (export competitors) cost/pricing structure. - Capacity building of local companies in R&D and lifestyle product design.
Probable partners - Leather goods and Footwear Manufacturers and Exporters Association: Apex trade body of the leather goods and footwear industry.

Light engineering: By playing a backbone role of the nation's manufacturing industries, the light engineering sector of Bangladesh is contributing around 1.5 percent to the country's GDP. In FY 2017-18, the overall market size of light engineering stood at $3.125 billion which created 800,000 jobs. With the export footprint in 33 countries, the industry has ensured export earnings of $688 million in FY 2016-17, although the export declined almost 50 percent in FY 2017-18 owing to fluctuating base metal price in the international market. This sector is poised to grow and expected to reach $12.06 billion in 2023 in line with the exponential growth of domestic forward linkage industries such as automotive, agro-machinery, bicycle, and plastic.

Challenges/need for development
- Old or second-hand machinery parts and tools lower down the quality of the design as it doesn't give smooth finishing of the products. As a result, overall productivity and quality is an issue. - Around 90 percent of enterprises are micro and small-sized, informal in nature- meaning they offer low bankability from traditional financial institute perspective. - Low-grade raw material with no testing facility is causing lower growth in export earnings. - The industry has no Common Facility Centre (CFC) and there is a lack of metal and heat treatment facilities too.
Recommendations for USAID/Bangladesh
Opportunity for interventions with the private sector - Initiative to train MSME entrepreneurs in financial due diligence. - Work on light engineering association's capacity building in advocacy, decent work and compliance. - Export focus market research and consultancy support to SMEs in different clusters. - Provide advocacy support and technical collaboration for technology upgradation and building common facility centers.
Probable partners - Bangladesh Engineering Industry Owners Association (BEIOA): Apex trade body of light engineering industry owners. - Bangladesh Agricultural Machinery Merchant Association (BAMMA): Apex trade body of agriculture machinery importers and producers. - Walton Group: Manufacturing world-class nuts, bolts and screws which are known as fasteners in engineering sector. First electronics giant in Bangladesh to extend production towards backward integration.

Medical equipment: The sector is largely import driven as 85 percent of the total products are imported. The domestic market stands at $350 million where only one company has the export footprint of $447,491 in FY 2017-18. Domestic players mostly produce *consumable products* (low value-added one-time-use equipment such as syringes and needles.) whereas all high value-added equipment is imported. A few early-stage companies (startups) are trying to disrupt the industry by manufacturing biomedical devices but there is a high barrier to entry and expand. In few cases, they have the technical capacity for conducting required R&D but *access to finance* emerges as a hindrance.

Challenges/need for development
- The un-regulated local market is highly dominated by low quality and cheap products. - High tax burden in imported raw materials. - Absence of fiscal/non-fiscal incentives promoting local manufacturers.
Opportunity for interventions with the private sector - Grant support for start-ups. - Scoping research to find out potential medical equipment device which can reduce import dependency and

can produce in large scale by a local manufacturer.
- Facilitate investment and joint venture collaboration.

Probable partners
- JMI Syringes Ltd: The only large-scale medical equipment producer of the country.
- Bi-beat ltd: start-up exporting medical equipment in a small scale.

Pharmaceuticals: The sector achieved satisfactory CAGR (approximately 17 percent in the last five years) generating around $2.44 billion worth domestic revenue in FY 2017-18 of which 90 percent market share is captured by local manufacturers. Firms are exporting drugs to over 127 countries but 60 percent of the export earning is concentrated in LDC countries such as Myanmar, Sri Lanka, Philippines, Vietnam, Afghanistan, Kenya, and Slovenia. Moreover, the sector is highly vulnerable to external shocks as 85-90 percent of the raw materials are import driven. Government has taken initiative to reduce the import dependency in the sector by declaring *API (Active Pharmaceutical Ingredient) and reagent* as an industry which will receive the highest fiscal and non-fiscal support. Emerging healthcare delivery channels (new clinics, hospitals and pharmacies) particularly in the rural market will strengthen the pharma sales volume as 15 million people are expected to rise above poverty by 2020. Private hospitals are expanding in tier-2, tier-3 cities which will increase the overall pharma sales in the peri-urban and rural region. The sector will spur the current growth rate in the domestic market and the subsector will expand rapidly to $7.6 billion by 2023.

Challenges/need for development

- High import dependency for raw materials resulting in high vulnerability to external shocks.
- Absence of bioequivalence testing lab.
- Lack of skilled manpower for clinical and biotechnology research.

Recommendations for USAID/Bangladesh

Opportunity for interventions with the private sector
- Partnership with the pharmaceutical industry association to address AMR (Antimicrobial Resistance): launch a nationwide campaign with a view to raising awareness about 'Superbugs'[4], about how self-medication/unauthorized medication of antibiotics can lead to death.
- Partnership with the government of Bangladesh to:
    - Strengthen laboratory capacity so that research on AMR prevalence and outbreak can be tracked locally/efficiently.
    - Advocacy to create a regulatory framework which takes strict actions against the counterfeit or poor quality of antimicrobial medicines and enforces OTC drug sales monitoring and surveillance.
- Continuous support for getting quality assurance certification to tap into highly regulated markets like the USA and EU.
- Establishment of a common facility center is necessary for Bangladesh which will able to deliver/process clinical data and develop medicines.
- Initiate partnership with universities for research and experiment for new vaccines and medicines.

Probable partners
- Bangladesh Association of Pharmaceutical Industries (BAPI): Apex trade body of pharmaceutical manufacturers
- Renata: Active in partnering with development agencies to test new models and scale up innovation.

The companies listed below are the partners of USAID/Bangladesh Trade Facilitation Project- 2, this partnership can be leveraged for further activities.
- Incepta Pharmaceuticals.
- Beximco Pharmaceuticals.
- Square Pharmaceuticals.

Plastic: The total market size of the plastic industry stood at approximately $2.9 billion in FY 2017-18. Being the 12th largest export earning sector of the country, the direct export from *Plastic* was recorded at $98.48 million in FY2017-18

[4] Overuse and misuse of antibiotics has prompted some strains of bacteria to make a small change in their DNA and become antibiotic-resistant "superbugs".

in addition to $900 million worth of *deemed export (indirect export through RMG: hangers, packaging components)*. The domestic demand of the same year was reported at $1.9 billion with 20 percent growth from the previous year. The industry is driven by MSMEs as evident from the fact that 98 percent of the industry enterprises are medium or small-scale companies who employ close to 1.2 million people directly and indirectly. A few sub-sectors have achieved growth at break-neck pace, e.g. *plastic toys;* have grown 2,075 times in the last decade, plastic recycling is also gradually becoming a booming sub-sector. With such growth trend, the industry is expected to reach $7.2 billion revenue by 2023.

Challenges/need for development
- Import dependency is as high as 100 percent for manufacturing plastic goods. - Lack of technical knowledge, intellectual property rights and scarcity of skilled designers.
Recommendations for USAID/Bangladesh
Opportunities - Initiate value system development to minimize the import dependency of molds, dices, and machinery. - Initiate special development plan for the subsector, plastic toys. - Initiate special policy mapping for waste management and plastic recycling.
Probable partners - Bangladesh Plastic Goods Manufacturers and Exporters Association (BPGMEA): Apex trade body of the plastic goods manufacturing industry. - Bangladesh Petrochemical Company Ltd. (BPCL): First post-consumer bottle to bottle PET recycling plant in Bangladesh.

Renewable energy and energy efficiency: Renewable energy is contributing only 2.79 percent[5] of the total energy mixture. The market is significantly dominated by Solar and Hydro with close to 90 percent contribution to the renewable energy portfolio. The domestic market is estimated at $512 million and projected to grow seven times in the next four years reaching to $3.7 billion by 2023. Solar Home Systems market is driven by the government-backed institutional fund and the hydro plant is owned by a public utility. Private sector actors have entered in the large-scale solar park projects recently and 23 new plants will be live soon generating approx. 1,470 MW. Bangladesh has potential to generate 30,000 MW in wind energy; however, private sector footprint has remained insignificant in this subsector as of now. In 2018, the country's first comprehensive wind resource mapping report was published by USAID-NREL which is gradually creating interest among the independent power producers.

Bangladesh has potential in *end-use* energy efficiency gains including industrial, residential appliance and commercial buildings/service has around 50 percent energy-saving potential where industrial and residential buildings have around 30 percent energy saving potential by adopting *Energy Efficiency and Conservation* interventions (EY and IDCOL, 2019). Currently, the market is concentrated in the industrial sector as a few RMG factories have adopted energy-efficient infrastructure to ensure compliance standard. SREDA drafted regulation for *Appliance standards and labelling 2018*, ministry of housing and public works drafted *Building Energy and Environment Rating for Design and Construction of buildings*. These policies and regulations will be crucial to unlock the market in full potential. According to IFC, Bangladesh's estimated climate-smart investment potential between the period of 2018 and 2030 is about $172 billion whereas industrial sector has $2 billion and residential green building sector has around $118 billion investment opportunity (IFC, 2019).

Challenges/need for development
Solar - Challenge in land acquisition - Low irradiance: GHI[6] in India is 6 kWh/m2/day where in Bangladesh it is about 4.5 kWh/m2/day. - Absence of smart-grid: Solar power is intermittent in nature; thus, it requires robust and reliable grid system which can absorb power beyond a certain capacity.

[5] The calculation is based on the total installed capacity of 20,430 MW retrieved from http://www.powercell.gov.bd/site/view/powerdiv_achievement_at_glance/- last accessed in May 8, 2019

[6] Global Horizontal Irradiance (GHI) is the total amount of shortwave radiation received from above by a surface horizontal to the ground

- Financial market challenge: Lack of deep domestic financing market to provide long term financing to projects, insufficient institutional investor, and limited foreign currency financing capacity.

Wind (entry barriers faced by the private sector)

- Weak due diligence: Wind maps developed over the last 15 years failed to cope with modern wind turbines and utility-scale wind technologies, resulting in insufficient private sector interest.
- Project development challenges: Lack of site-specific wind data decreases investor interest, installation of wind turbines, and rotors need wider road connectivity.
- Absence of value chain: Equipment and spare parts of wind technologies are 100 percent import driven; only a few countries like Germany and China has the full value chain.

Waste to energy

- Weak and unregulated waste management system is one of the biggest challenges for the private sector.

Recommendations for USAID/Bangladesh

Opportunity for interventions with the private sector

- Dialogue for knowledge exchange on USAID/NREL project findings with potential private sector actors having existing footprint in other renewable (Solar) projects.
- Research, market support for solar energy retailing in the hard-to-reach areas.
- Awareness and capacity building for residential building owners on energy efficiency.

Probable partners

- ME SOLshare ltd: Country's first solar energy retailing start-up working in the rural and hard-to-reach areas.
- Joules power Ltd: First solar IPP of Bangladesh has got an active interest in pursuing wind projects.
- Rahimafrooz Solar: Solar equipment manufacturer.
- Bangladesh Green Building Academy: BGBA's LEED Accredited Professionals can assist developers, building owners, and architects with designing and certifying projects to various USGBC (U.S. Green Building Council) LEED standards. This entity can be a key catalyst in the propagation of industrial energy efficiency best practices.
- Real Estate and Housing Association of Bangladesh (REHAB): Apex trade body of private real estate sector. An important stakeholder to promote/enforce energy-efficient lifestyle/infrastructure across residential apartments and buildings.

Shipbuilding: The sector is standing at $2 billion in terms of the domestic market and expected to grow two-fold by 2023 driven by increasing demand of inland transport vessels from local private sector (LPG operator and FMCG operator) players and growing government procurement of a dredger vessel. After a period of continued decline throughout FY 2012-13 till FY 2016-17; export has gone through a turnaround in the latest fiscal year. Local operators could regain substantial export receipt by achieving 456.8 percent year on year export growth in FY 2017-18, but the amount is significantly small and only one company has captured 89 percent of the earnings. On the flip side, the country has the potential to tap into $400 billion mid and small-sized global ship market as historically Bangladesh has been producing less than 15,000 DWT vessels. For the industry to grow and challenge global peers such as China, Korea, and Japan; at least 10 percent of the total shipyards among more than 125; must be upgraded to gain export-ready status.

Challenges/need for development

- High-interest rate hindering competitiveness in global landscape.
- Shipyards, particularly the export-oriented ones, are highly dependent on imported raw materials due to the absence of quality steel plates and required shipbuilding components in the country.
- Lack of home-grown designs and innovation in shipbuilding architecture, including lack of sector-specific white-collar people, especially designers and naval architects.
- Lack of design mode testing facility.
- Inadequate business-to-business marketing and matchmaking in the global market.

Recommendations for USAID/Bangladesh

Opportunity for interventions with private sector

- Conduct a series of on-site audit and facilitate local players for upgrading their yard infrastructure to export-

ready level.
- Awareness campaigns with small and medium local shipyards to strength compliance best practices for improved work environment.
- Facilitate strategic international market access for small-mid-sized vessels category.

Probable partners
- Western Marine Shipyard Ltd: The market leader generating 90 percent of the total export receipt so far. Diversified portfolio including shipbuilding, dredger making, port infrastructure erection and commissioning.
- DESH Shipbuilding and Engineering Ltd (Prantik Group): One of the leaders in small vessel category for domestic market. The innovative vision of the founder plans to build high value-added items such a deep-sea fishing trawler and hoverboard.

Shrimp and fish: Of the $532.03 million fish and fishery products exported by Bangladesh during FY 2016-17, almost 90 percent was contributed by shrimp only. Although bulk of Bangladesh's frozen food export is dominated by shrimp, the sector is hamstrung by the consistent low price, diseased seed, value chain inefficiency, shortage of quality raw materials, and a lack of scientific culture. Throughout the last five fiscal years, shrimp export has been on a declining slide with a negative CAGR. The estimated size of the domestic market is worth around $600 million which is poised to grow with the rising purchasing power of urban consumers. There are around 800,000 farmers are involved in this sector, practicing mostly extensive (traditional, not improved) method of farming.

To diversify beyond shrimp, the country is also trying to tap into the export market of mud crabs, seaweed and fish fillets. The export of mud crab has started at a moderately strong pace with export earnings of $36 million in FY 2018-19. Although seaweed farming is still at the nascent level, it has exponential growth prospect as Bangladesh has 10 commercially important species and 25 million square meter shoreline area with potential for seaweed cultivation. With a similar trend as of now, the industry is expected to reach only $1.3 billion in 2023. However, with the developed farming method and diversified export basket, the scenario would be different.

Challenges/need for development

- Majority PLs sourced from wild broodstock-30 to 80 percent of broodstock carry white spot disease.
- Only two SPF Hatcheries produced approximately 130 million PLs when demand was of around 10 billion.
- Farmer's capacity gap (knowledge regarding deepening pond, PCR screened seed stocking, and water and feed management, biosecurity measures) lead to only 10 to 20 percent survival rate in the pond.
- Lack of streamlined/integrated value chain: multiple layers of middlemen lead to a vicious cycle of credit burden, adulteration and poor handling leading to loss in quality.
- Challenges of managing access to finance at farmer level.

Recommendations for USAID/Bangladesh

Opportunities
- Initiate more SPF Hatcheries to meet the total demand by supplying enough disease-free seeds.
- Facilitate training on the semi-intensive and intensive farming method to the farmers.
- Investment in mud crab hatchery technology.
- Establish efficient and viable transport system for crablets.
- Engage with feed companies to produce formulated diets for crabs of various stages.

Probable partners
- Bangladesh Shrimp and Fish Foundation (BSFF): Apex trade body of Bangladesh shrimp and fish industry
- Farmer's Market Asia: Bangladeshi early-stage enterprise planning to become Asia's largest agricultural online auction marketplace with credible and verified inventory /database that allows farmers and traders to engage, interact and trade cross border on a single platform.
- Deepa Sea Foods Limited: With deeply rooted shrimp collection network, this company doubled down processing capacity in the last fiscal year while almost 70 percent of processing plants are closing off. They are envisioning further growth/access to high-end global buyers where they are willing to partner with USAID/Bangladesh for increasing compliance/best practices.

Telecommunications: The current domestic market size of the fifth largest mobile market in the Asia Pacific region is $3.8 billion. In FY 2016-17, the sector has grabbed FDI worth $593.89 million which was the highest among all other individual sectors in that fiscal year. Telecom sector has been experiencing sluggish growth in the face of rapid digital disruptions and unfavorable regulatory regime whereby publicly traded/ listed corporations have been imposed with a 40 percent income tax and unlisted telecom operators are exposed to a 45 percent income tax. The growth drivers are indicating that by 2023 the market size will be $5.08 billion.

Challenges/need for development
- Rise of Over the Top (OTT) applications which are gradually eating up core revenue stream of telecom vertical. - High corporate tax and auction price at a market (Bangladesh) with lowest ARPU: low investment on network upgradation and maintenance.
Recommendations for USAID/Bangladesh
Opportunities - Support internet-based startups that have a cross-cutting impact with other industries such as Telemedicine, Ridesharing. - Introduce IT-enabled working space to support entrepreneurs, freelancers, and crowdsourcing in the rural area. - Initiate collaboration with small ISPs to provide last-mile services.
Probable partners - Grameen Phone: Leading mobile network operator of Bangladesh has set certain breakthrough trends in terms of entrepreneurship promotion/innovation facilitation. - Robi: The second-largest mobile network operator in Bangladesh who is also deeply involved in the socio-economic development and trail-blazer in unveiling unique digital solutions.

Tourism: The size of the tourism industry was reported at $5.3 billion with approximately 2.2 percent of GDP contribution in 2017. Local tourists account for roughly 98 percent of the revenue generation with only two percent of foreign visitors for the purpose of both business and traveling. The *visitor exports* have generated $228 million in 2017 and expected to grow 6.20 percent per annum during 2018-2028 resulting in $445 million visitor export in 2028. The direct employment contribution of the tourism sector during 2017 was approximately 1.17 million jobs. 100,000 foreigners (90 percent business travelers, around five percent tourists) entered Bangladesh in FY 17-18 and this number is growing at 22 percent year on year which is poised to increase in the supply of upscale hotel rooms by 140 percent in 2021. The industry is expected to rise by 6.8 percent per annum to $7 billion by 2023.

Challenges/need for development
- Lack of PR efforts for the international target audience aiming niche tourist cohorts such as budget-travelers, adventure-tourists and faith-based tourists (religious tourism). - Unplanned tourism infrastructure harming biodiversity and natural environment. - High VAT and taxes hindering the growth of small and medium-size hotels and resorts in the tourism sites.
Recommendations for USAID/Bangladesh
Opportunities - Initiate dialogue with the government to reform tax and VAT policy. - Initiate training, skill development, and develop market strategies, R&D, and innovative ideas of promotions for creating demand. - Facilitate local handicraft sector as a boutique idea to attract foreigners and improve visitors export. - Facilitate tourist ventures promoting community tourism at remote/traditionally excluded regions.
Probable partners - Nazimgarh Resort: Built-in eco-friendly environment, Nazimgarh believes in working for the development of the surrounding community. - Munlai Community Tourism: Launched a commercially successful responsible community tourism initiative in CHT (Bandarban).

Entrepreneurship: Technological change is key to improved productivity and economic growth. Digitization, in particular, can help diversify the economy, attract new types of dynamic investment, engage young people and unleash their talents, all of which are emerging requirement to transform Bangladesh to a middle-income economy. To that end, the sector has grown by leaps and bounds in the last five years. What began as a series of ad hoc, mostly day(s)-long events has become a full-fledged ecosystem with full-time incubation and acceleration programs. Besides, mushrooming of co-working spaces and the influx of venture capital (from both domestic and international sources), along with notable case studies of start-ups have grown in scale and attracted significant investment. All this, in turn, are driven by an expanding consumer market, rising internet use, a young urban population with an appetite for digital services, positive government action, and a growing support network.

Challenges/need for development
Starting and operating a business in Bangladesh as an entrepreneur is a challenge. It is even more challenging for the entrepreneurship support organizations, due to significant lack of structured programs (starting with the selection process and the needs analysis) and guidance for entrepreneurs. One of the crucial challenges is to source and secure the early-stage funding for start-ups. There is also a major policy gap including the inability for all but a select few large Bangladeshi companies to take funds out of the country to set up legal foreign subsidiaries in order to service international customers and the existence of a repatriation tax which naturally deters foreign investment. There is also a severe dearth of public-funded research and development at the university level, which provides the first level of incubation for innovations and technologies in different fields. Due to policy barriers, patents and copyrights also take years to obtain and are hard to enforce for small start-ups.
Recommendations for USAID/Bangladesh
Opportunities Bangladeshi universities, with strong research track record and strong business/entrepreneurship programs, can be connected with the relevant universities in America within the USAID network. These American universities can provide technical assistance to those Bangladeshi universities and can jointly collaborate on research, which will provide support to commercialization of new technologies and business models. USAID can look for similar opportunities to match American companies, particularly those who help with innovation, technology, and business start-ups, to Bangladeshi entrepreneurs. USAID may also seek to engage innovative Bangladeshi businesses that can serve as critical value chain partners in its market development efforts. USAID can also seek to leverage America's extensive experience with relevant regulations around IP, venture capital, taxation and managing an inflow of foreign technology talent to support relevant organizations like BIDA Department of Trademarks and Securities and Exchange Commission need to significantly boost their capacity to deal with and facilitate start-ups and technology-enabled companies.
Probable partners - American universities like Kansas State University can be connected with Bangladeshi universities such as Bangladesh Agricultural University, Bangladesh University of Engineering and Technology, Independent University Bangladesh, University of Dhaka, BRAC University and University of Liberal Arts Bangladesh. - For capacity building of regulatory bodies, USAID can work with BIDA, Department of Trademarks and Securities and Exchange Commission.

2.2 Application of a comparative assessment framework to select key sectors

2.2.1 *Introduction*

The comparative assessment framework will help to identify potential sectors for USAID/Bangladesh intervention. The assessment team created the framework consisting of three elements which have been outlined in the following pages:

i. Comparative sector scan
ii. Sector scoring matrix
iii. Selection of growth inclusive sector graph.

At first, the comparative sector matrix was constructed to assess each sector's strengths, limitations, opportunities, availability of resources, and impact potential on the economy. At the second level, each sector was scored on a scale of ten. At the next stage, the sectors were plotted in a two-dimensional graph based on the score obtained from sector scoring matrix.

Entrepreneurship being a cross-cutting sub-sector, the assessment team did not consider that as a stand-alone industry which is to say, this framework will be applied on 15 priority sectors.

2.2.2 *Comparative sector scan*

The comparative sector scan/assessment framework comprises of nine factors (referred to as *F*) and 24 sub-factors utilizing existing evidence base, synchronization of data structure and sector insider inputs. In this assessment, domestic (F1) and export (F2) market size (in million $) has been considered to understand the market potential of each sector. F3 focuses on fiscal and non-fiscal support from the government to understand sectoral alignment with the government's overall vision. Employment size (F4), multiplier (F8) and inclusion potential (F5) -these three factors together have indicated each sector's job creation potential and the ability to facilitate marginalized population within the workforce. The assessment team has also analyzed the strength of the value chains (F6) to check the vulnerability of the sector from any external shock. Environment (F7) has been taken into consideration to understand the consequences and threat to the natural environment encompassing each sector. Finally, the team has considered future growth potential (F9) as one of the key factors, to project and understand the long-term impact potential of the sector on the economy.

The table below illustrates a detailed outlook of each factor, sub-factor, rationale behind selection and most importantly the source of data as per each sub-factor

Factors	**Sub factors (weightage)**	**Rationale**	**References**
F1 Domestic market	1. Current domestic market size (100%)	To understand the domestic strength of the sector (value in million $) by comparing other sectors	Data retrieved from Bangladesh Bank CPI database, World Bank and key informant interview with industry associations, meta data from secondary research papers (World Bank database, 2018) (Bangladesh Bank Open Data Initiative, 2019)

F2 Export market	1. Current export market size (100%) 2. Number of export market destinations (50%)	To understand the strength of export earnings and number destination market by comparing other sectors	Data retrieved from Export Promotion Bureau, Bangladesh Bank economic database, World Bank and key informant interview (Export Statistics Book, 2018) (World Bank database, 2018) (Bangladesh Bank Open Data Initiative, 2019)
F3 Alignment with GoB vision	1. Cash incentive (Export) (100%) 2. Presence in 2018-2021 Export Policy/BIDA priority (100%) 3. Presence in EZ policy (100%) 4. Presence in industry policy 2016 (100%)	In fiscal incentives, cash incentive, tax holiday facility and Bangladesh Bank's special support in access to finance were taken into consideration to find government's priority in support initiatives for a sector. In non-fiscal support the assessment team has analyzed the sectors' availability and priority in recent export policy, industry policy and priority entry facility from BIDA and BEZA. The combination of fiscal and non-fiscal support accelerate investment (local and foreign) and provide cost advantage to entrepreneurs to compete in the global market	Retrieved from Bangladesh Bank, National Board of Revenue, Bangladesh export policy 2018-21, Bangladesh Industry policy 2016 and BIDA (Monetary Policy Statement, 2018) (National Board of Revenue Bangladesh Policy, 2018) (Bangladesh Export Policy 2018-21 & 2019) (Bangladesh Industry Policy 2016, 2017) (BIDA Potential Sectors, 2019)
F4 Current employment	1. Current employment size (100%)	To determine the strength of employment generation and the capacity of adapting the skilled/unskilled population with sector growth	1. Labor force survey 2016-17 and BIDS Study Report 2. Labor Market and Skill Gap in Bangladesh by Bangladesh Ministry of Finance, (Bangladesh Labor Force Survey 2016-17, 2017) (LABOUR MARKET AND SKILL GAP IN BANGLADESH, 2017)

F5 Inclusion potential	1. Inclusion of female employment (100%) 2. PwD inclusion (80%) 3. Third gender inclusion (80%) 4. Ethnic minority (80%) 5. Inclusion of unskilled labor force (100%)	To determine the current situation of female employment and assess the future potential of adapting marginalized and excluded population	1. Differently-abled (13 million): **(a)** Leadership cognition of reasonable accommodation | **(b)** Buyer Compliance measures | **(c)** Ecosystem player presence (ILO/SEIP/GoB/ Bangladesh Business and Disability Network) | **(d)** Job Analyses (Evidence from emerging economies) 2. Third Gender (100,000): **(a)** Frontline Customer touch point presence Vs. Back office work | **(b)** Presence of case of third gender employment in sector | **(c)** Leadership perception 3. Ethnic Minority (2.2 million): Cross-plotting location with industrial cluster 4. Report on Bangladesh growth diagnostic by the Asia Foundation (Bangladesh Sectoral Growth Diagnostic, 2017)
F6 Strength of value chain	1. Domestic source of prime raw material: yes/no 2. Quality of the input 3. Maturity of the industry 4. Stable constant supply	To understand the vulnerability of the sector from external shock first the percentage of the raw material was measured which was sourced from the domestic market, second, information on the quality of the raw materials were extracted, the current status quo in the market and stability of the supply in the market	Inspira extrapolation based on Key informant interview, On site mission and Amalgamation of existing research.
F7 Environment	1. Categories under Environmental Conservation Rules (Green, Orange A, Orange B, Red)	To measure the consequences and treat on environment for each sector the government categorization of environmental clearance was followed.	Categories of Environmental Clearance Procedure published by Bangladesh Department of Environment, Ministry of Environment and Forests (Environmental Clearance Procedure, 2010)
F8 Multiplier	1. Number of jobs created for one-million-dollar demand	To understand the potentiality of the sector's ability in cross-sectoral job creation in line with future	Retrieved from co-publication of the Asian Development Bank and the International Labor Organization on Employment Diagnostic Study (Bangladesh Sectoral Growth Diagnostic, 2017)

		growth.	
F9 Future Growth Potential	1. Presence of consumer market dynamics impacting growth potential in five years 2. Historic trend (CAGR) in both export and domestic market 3. Impact potential of government reform/mega projects 4. Interest of regional investors to shift from China (or other key sourcing destinations) towards Bangladesh 5. Presence of required white-collar workforce	The potential market size (in billion-dollar) was calculated for each sector considering the future market both for domestic and export based on the evidence that might help the sector grow in massive scale.	Inspira extrapolation based on projected domestic and export market size through past CAGR, Growth catalyst by FDI dynamics, present in Bangladesh Business Confidence Index and presence in ADB Bangladesh economic corridor development. (Realizing the Potential of Bangladesh through Economic Corridor Development, 2018)

2.2.3 Sector scoring matrix

The reference value of each sector as per the comparative scan framework has been tabled below:

Name of Sectors	Domestic Market (FY 2018/19) in Million USD	Export Market (FY 2018/19) in Million USD	Number of Countries	Cash Incentive (Export, %)	Presence in 2018-2021 export policy/BIDA priority	Presence in EX planning	Positioning in Industrial Policy 2016	Current Employment in Million	Female	Unskilled	Domestic source of prime raw material: YES/NO	Environment	Multiplier (Number of jobs created for one million dollar demand)	Projected market size of 2023 in Billion USD
	F1 Strength of Domestic Market	**F2 Export Market size (FY 2018/19)**		**F3 Fiscal and Other GoB Incentives**				**F4 Current Employment**	**F5 Inclusion**		**F6 Strength of value chain**	**F7 Environment**	**F8 Multiplier**	**F9 Future Market Potential**
Agribusiness	3545	635	144	20, (processing of locally produced fruits and vegetables)	Priority Sector	5	Highest Priority Sector	0.3	22%	99.90%	YES	Orange A	456	8.23
Automotive/ Truck/ Buses Assembly	13890	1.5	1	10 (Automobile manufacturing industry)	BIDA	4	Priority Sector	0.05	5%	84.70%	NO	Orange B	567	32
Ceramic	668.54	52	50	10	Special priority sector	3	Not Mentioned	0.048	40%	92.50%	NO	Orange B	216	1.56
Health Care	5920	N/A	N/A	N/A	BIDA	2	Priority Sector	0.25	60%	33.30%	YES	Orange B	163	11.71
ICT and Outsourcing	1100	600	60	10 (Only industry which has Income tax exemption)	Priority Sector	10	Highest Priority Sector	0.94	20%	92.50%	YES	GREEN	78	12
Leather and Leather Goods	1900	1000	84	Processed leather 10, Leather Product 15	Priority Sector	8	Highest Priority Sector	0.6	23%	99.50%	YES	RED	212	4.8
Light Engineering	3125	356	33	15 (bi-cycle manufacturing industry)	Special priority sector	5	Highest Priority Sector	0.8	10%	86.70%	Partially	Orange B	929	12.06
Medical Equipment	350	0.44	1	0	BIDA	0	Not Mentioned	0.01	30%	89.70%	NO	GREEN	233	0.736
Pharmaceuticals	2440	103.46	127	10 (Tax exemption for API as well as Pharma)	Priority Sector	7	Highest Priority Sector	0.172	16%	97.40%	NO	GREEN	306	7.6
Plastic	1800	1000	68	10	Priority Sector	5	Priority Sector	1.2	28%	84.70%	NO	Orange B	265	7.2
Renewable Energy and Energy Efficiency	512	N/A	N/A	10 PV MoD (renewable energy (e.g energy saving bulb, solar energy plant, windmill)	Special priority sector	2	Priority Sector	0.001	1%	73.80%	Partially	GREEN	103	3.7
Ship Building	2200	30.35	15	10	Priority Sector	4	Priority Sector	0.15	3%	84.70%	Partially	RED	189	6
Shrimp	370	431	20	Upto 10	Special priority sector	1	Priority Sector	0.85	50%	99.50%	YES	Orange B	272	1.3
Telecommunication	3800	N/A	N/A	N/A		2	Not Mentioned	0.245	7%	92.50%	Partially	GREEN	78	5.08
Tourism	5300	228	N/A	N/A	Special priority sector	5	Priority Sector	1.1	13%	92.80%	YES	Orange A	487	7.5

At the second stage, the assessment team has converted the reference value table into a **scored matrix** by scoring the highest reference value in each factor

Sl	Sectors	F1 Strength of Domestic Market	F2 Present Export Potential	F3 Fiscal and Other GoB Incentives	F4 Current Employment	F5 Inclusion Potential	F6 Strength of Value chain	F7 Environment	F8 Multiplier	F9 Future Growth Potential	**Final**
1	Agribusiness (Food Processing)	4.58	5.87	9.82	2.50	8.48	10.00	7.00	4.91	3.96	**6.35**
2	Automotive/ Truck/ Buses Assembly	10.00	0.04	6.96	0.42	4.36	6.39	4.00	6.10	10.00	**5.36**
3	Ceramic	0.75	1.87	3.57	0.40	7.80	6.67	4.00	2.33	0.75	**3.13**
4	Health Care	6.66	0.00	4.50	2.08	8.92	7.78	5.00	1.75	5.63	**5.29**
5	ICT and Outsourcing	1.24	6.28	10.00	7.83	10.00	10.00	9.00	0.84	5.77	**6.77**
6	Leather and Leather Goods	2.14	10.00	7.68	5.00	7.61	8.61	1.00	2.28	2.31	**5.18**
7	Light Engineering	3.52	3.65	6.25	6.67	8.39	8.06	3.00	10.00	5.80	**6.15**
8	Medical Equipment	0.39	0.03	1.96	0.08	5.89	7.50	8.00	2.51	0.35	**2.97**
9	Pharmaceuticals	2.75	4.53	8.21	1.43	7.29	8.33	9.00	3.29	3.65	**5.39**
10	Plastic	2.03	2.76	6.43	10.00	6.31	7.78	3.00	2.85	3.46	**4.96**
11	Renewable Energy and Energy Efficiency	0.58	0.00	7.50	0.01	5.43	4.44	10.00	1.11	3.70	**3.64**
12	Ship Building	2.48	0.67	5.54	1.25	6.10	8.61	2.00	2.03	2.88	**3.51**
13	Shrimp	0.42	3.83	5.89	7.08	7.27	8.33	3.00	2.93	0.46	**4.36**
14	Telecommunication	4.28	0.00	1.07	2.04	7.45	8.89	9.00	0.84	2.44	**4.50**
15	Tourism	5.97	1.71	4.93	9.17	7.79	9.17	6.00	5.24	3.61	**6.48**

with a ten-point scorecard and other values with proportionately lower scores- as illustrated below:

Brief explanation of each factor and how different sectors have performed/scored against each other in line with a certain factor- has been provided in the following sections:

F1: Strength of domestic market

The strength of the domestic market is measured based on the value of product produced/distributed in the local market for the fiscal year FY 2017-18. To prepare the comparative ranking, the size of the local market is calculated for each sector using top-down approach[7]. Together these 15 (excluding Entrepreneurship) sectors contributed around $42.5 billion in the domestic market during the reference time frame. Automotive/Truck/busses assembly positioned as the top sector with the highest amount contribution of around $13.89 billion. Medical equipment positioned at the last with the lowest contribution of around $350 million. Healthcare positioned second with the market size of $5.2 billion whereas tourism sector positioned third as the sector registers annual revenue of $5.3 billion.

F2: Present export potential

The present export potential has been measured based on the value of exported goods/services in the global market for fiscal year FY 2017-18. To prepare the comparative ranking, the size of the export value is calculated from the data retrieved from Bangladesh Bank, Export Promotion Bureau, and industry associations. The data is then validated by a triangulation-method through key informant interview and stakeholder consultation workshop. Together these 15 sectors are contributing around $4.17 billion in the export basket in FY 2017-18. Leather and leather goods, plastic, and agro-processing positioned as the top three sectors. Medical equipment positioned at the last place with export earnings of $440,000. Healthcare, entrepreneurship, telecommunications, and tourism sectors do not have any export footprint, thus the value was not considered for the ranking.

F3: Fiscal and other GoB incentives

To understand the impact of government's several fiscal and non-fiscal supports, each sector was scored with a combination of four different sub-factors with same weightage. ICT and outsourcing positioned as the top sector for availing the highest amount of fiscal and non-fiscal support from government. Telecommunications has placed at the last as government has put rigid regulatory and tax structure on this sector among the comparators. Agro-processing and pharmaceuticals stood at the second and the third position. Processed food exporters' get 20 percent cash incentive, which is the highest for any export good incentive. Government has high priority for pharmaceuticals sector to make the sector sustainable in backward linkage.

F4 Current employment

The scoring is done based on the employment size of each sector. From the assessment, it has been found that 15 sectors cumulatively generate 6.71 million jobs. Among these 15 sectors, Plastic has scored 10 out of 10 with 1.2 million of current jobs followed by tourism (scored 9.17 with 1.1 million jobs), ICT and

[7] The top-down approach, also called the chain ratio method, involves defining a "universe" target market and applying various filters that continually reduces the figure to an estimation of the "net" market. Put another way, unlike the bottom-up approach, it started with an estimation of the overall market and then evaluates the (limited) successive proportions that it intends to reach. The method retrieved from the document 'Market Size Overview' published by IFC.

outsourcing (scored 7.83 with 940,000 jobs) and shrimp (scored 7.08 with 850,000 jobs). From the bottom of the list, renewable energy and energy efficiency has been ranked fifteenth with 1,000 jobs while medical equipment holds the title of second last sector.

F5 Inclusion potential

The inclusion potential of each sector has been identified through analyzing the inclusion of female labor force, PwD, third gender, ethnic minority and inclusion of unskilled workers. Ensuring high degree of inclusiveness in all sub-factors, ICT and outsourcing posited at the top achieving 10 out of 10. On the other hand, automotive/bus/truck assembly stood at the lowest stair with extremely low presence of PwD, ethnic minority, and female employment.

F6 Strength of value chain

The strength of value chain is ranked through identifying four sub-factors which have direct impact on the ecosystem: 1. whether the prime source of raw material is available in the local domestic market or not; 2. the quality of the input/raw material; 3. Maturity of the industry; and 4. Stable constant supply. The data and insights used for ranking were identified through Inspira extrapolation based on key informant interview, on-site mission and amalgamation of existing research. Referring back to the comparative scoring matrix, both agribusiness (food processing) and ICT and outsourcing have scored 10 out of 10. Due to the availability of locally sourced raw material, good quality of input, matured industry along with stable supply agribusiness was ranked in the top. At the same time, due to the presence of quality of infrastructure such as internet penetration nationwide presence and availability of hardware through low tax device import coupled with a number of local manufacturing plants of devices such as Samsung, Walton along with stable supply of skilled manpower, ICT and outsourcing was also ranked among the top. However, due to being comparatively new industry along with mostly import driven inputs, renewable energy and energy efficiency was ranked lowest with ranking 4.44 out of 10.

F7 Environmental inclusion

The environmental inclusion is identified through categories of environmental clearance procedure published by *Bangladesh Department of Environment*, *Ministry of Environment and Forests*. It is mandatory to obtain environmental clearance for every type of industry and project as per Bangladesh Environment Conservation Act, 1995 (Amended 2010). For the purpose of issuance of environmental clearance certificate, the impact on the environment is classified into the four categories such as *Green (Least harmful), Orange-A, Orange-B and Red (Most Harmful)*. Based on the fact that wind, solar, and hydroelectric systems generate electricity with least associated pollution and causing the least harm to the environment, Renewable energy and energy efficiency has been ranked in the green category with ranking 10 out of 10. ICT and outsourcing, pharmaceuticals and telecommunications industry is also placed in the top with ranking nine out of 10. In contrast, leather and leather goods have been ranked the lowest (one out of 10) due to high water pollution and environmental hazard.

F8 Multiplier (number of jobs created for one-million-dollar demand)

In 2016, ADB and ILO together, have conducted an employment diagnostic study named "Bangladesh: looking beyond garments". To prepare a comparative ranking for multiplier impact potential of each sector, that study report has been used as a guiding compass. The report estimates changes in jobs of a sector if demand (either in domestic or international market) changes by $1 million. As per the study, with changes of $1 million worth demand, light engineering sector will generate 929 additional jobs which is the highest compared to the other 14 sectors. So, light engineering has scored 10 out of 10 followed by automotive/

truck/ buses assembly, tourism and agri-business. Telecommunications, along with ICT and outsourcing have ranked at the bottom (0.84 out of 10) as these sectors produce lowest amount of additional job while changes (increase) occur in demand for their respective products or services by $1 million.

F9 Future market potential

The value of future market potential for each sector is projected based on six separate criteria. They are: i. presence of consumer market dynamics impacting growth potential in five years; ii. historic trend (CAGR) in both export and domestic market; iii. Potential to create youth employment; iv. Impact potential of government reform/mega projects; v. Shift in the investors' attention from China or Vietnam towards Bangladesh; vi. presence of required white-collar workforce. Based on these parameters an estimated market size is calculated for each sector.

A simplified table highlighting the top three sectors for each factor has been outlined below:

Sl.	F1 Strength of Domestic Market	F2 Present Export Potential	F3 Fiscal and Other Government Incentives	F4 Current Employment	F5 Inclusion Potential	F6 Strength of value chain	F7 Environment	F8 Multiplier	F9 Future Growth Potential	Combined
1	Automotive/ Truck/ Buses Assembly	Leather and Leather Goods	Agribusiness	Tourism	ICT and Outsourcing	Agribusiness	Renewable Energy and Energy Efficiency	Light Engineering	Automotive/ Truck/ Buses Assembly	**ICT and Outsourcing**
2	Healthcare	Agribusiness	ICT and Outsourcing	ICT and Outsourcing	Healthcare	ICT and Outsourcing	ICT and Outsourcing	Automotive/ Truck/ Buses Assembly	Light Engineering	**Agribusiness**
3	Tourism	ICT and Outsourcing	Pharmaceuticals	Shrimp and Fish	Agribusiness	Tourism	Pharmaceuticals	Tourism	ICT and Outsourcing	**Light Engineering**

2.2.4 Selection of sectors with potential to drive inclusive economic growth

At the third and final stage, the sectors have been plotted in a two-dimensional graph. The x-axis represents the economic incentive status of a sector which is the average score of six factors (F1 strength of domestic market, F2 present export potential, F3 fiscal and other GoB incentives, F4 current employment, F6 strength of value chain and F9 future growth potential). These factors represent a sector's capacity assessment on forward and backward market linkage which can be valued in measuring the monetary return of investment.

Y-axis represents the inclusiveness status of a sector, which is the average score of three factors (F5 inclusion potential, F7 environmental inclusion, F8 multiplier) incurred by each sector. These factors represent a sector potentiality assessment on inclusion which can be valued in measuring the social return of investment. The graph presented below identifies the top sectors with strong diversity and inclusiveness.

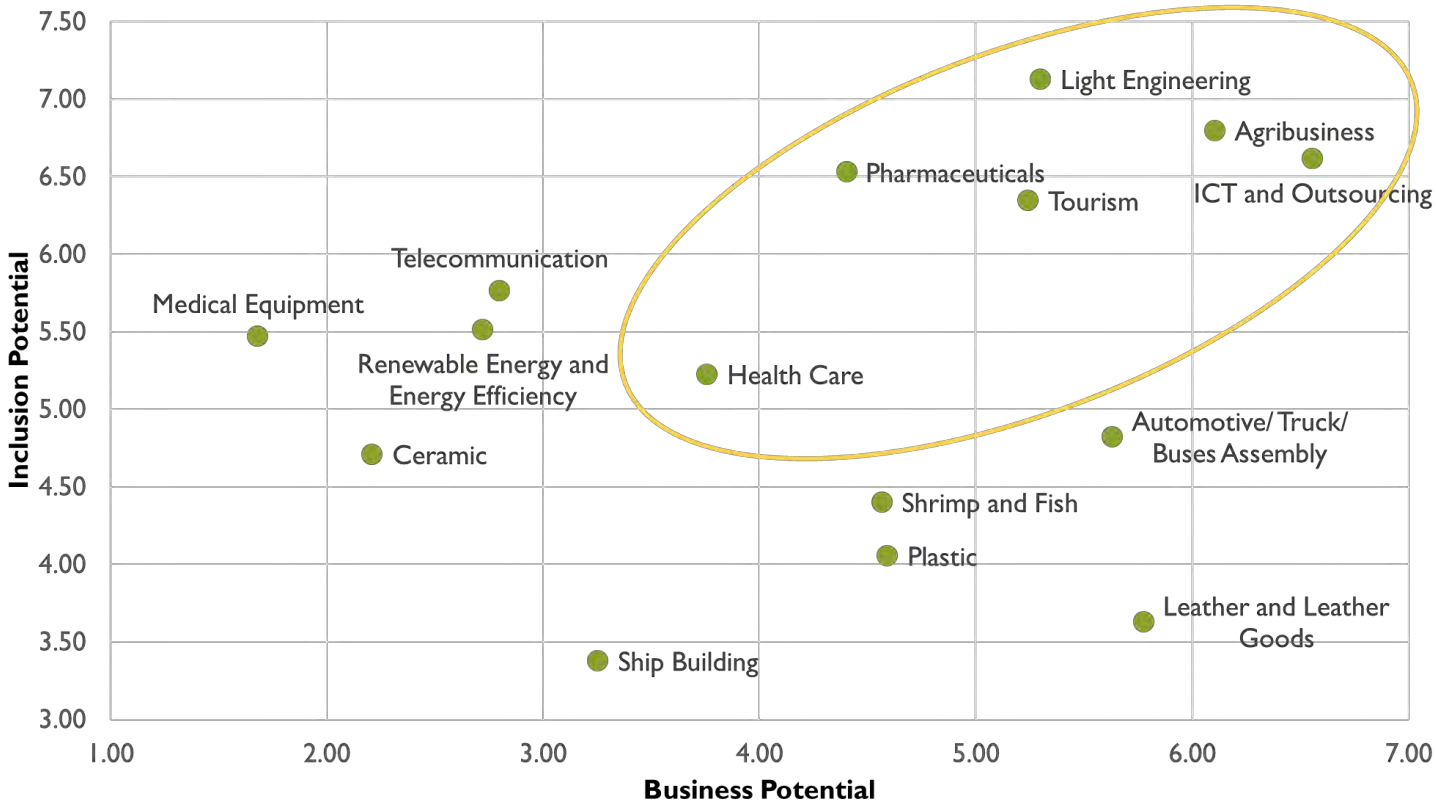


Figure 6 Sector mapping for selection

Upon completion of the abovementioned methodology steps, the assessment team has identified a pool of six key sectors including: healthcare, pharmaceuticals, tourism, ICT and outsourcing, light engineering and agri-business. These sectors can contribute both from economic or business value addition perspective and inclusive growth perspective thus ensuring a balanced approach in USAID/Bangladesh's future private sector engagement strategy.

2.3 Concluding remarks

Diversification of domestic private sector has an instrumental role to play in achieving sustainable and inclusive economic growth of Bangladesh. This assessment has selected a cohort of six key sectors with high impact potential, which can facilitate faster human capital accumulation, enhance productive growth and

strengthen export footprint. Therefore, it is imperative that USAID/Bangladesh prioritizes engagement with the sector stakeholders in line with the customized recommendation strategies and considers the findings of this deep dive assignment for designing future program strategies. In addition to sector-specific challenges, this study has identified a number of cross-cutting barriers or common problems which are restricting the private sector in general, from reaching their optimum potential. Engagement with such overarching, multi-sectoral challenges will trigger better value for investment of the limited investment funding of USAID/Bangladesh. As a concluding note, the assessment team would like to highlight such intervention ideas which can be incorporated in the short-mid-long-term programmatic design for private sector engagement.

Unlocking the full potential of region-specific business chambers

Except for the capital city-based key business chambers (ex: DCCI, MCCI, FBCCI), almost none of the regional/local chambers (ex. Rangpur chamber, Chattogram chamber) are involved in regular knowledge management initiatives for their respective focus sectors. Ideally, these associations would be the key platforms for pro-growth knowledge/research support as they are connected with grassroots level entrepreneurs and have first-hand exposure to on-site market dynamics. These associations can benefit from technical assistance provided by USAID/Bangladesh with the aim of strengthening their ability to facilitate respective sector's growth via regional resource mapping, sector analyses, investment attraction, cross-region/cross border matchmaking, and market access.

Promote the importance of compliance across MSME clusters nationwide

Majority of the MSMEs (Micro, Small & Medium Enterprises) of Bangladesh do not follow industry/government compliances and standards on social, environmental or related to workplace safety. Many clusters do not follow the infrastructure compliance and are located in the residential area as well. As a result, they cannot operate in large economic scale and remains in the threat of industrial accidents. A number of stakeholders tried to promote compliance initiatives among small entrepreneurs earlier but none of them highlighted the business benefits for following the compliances (return on investment of such initiatives). Creating awareness about the business benefit for following compliance can help the MSMEs to adopt standard best practices in a faster manner.

Enhance the capacity of the associations in policy advocacy

The apex trade bodies of the sectors/ associations are supposed to work as the important spoke-persons to influence policymakers in making laws and regulations, distribute resources, and make other decisions. In most of the cases, Bangladeshi trade associations suffer from strong advocacy papers/policy toolkits which should be used in the government negotiations. Thus, it is important to empower the associations with adequate knowledge on policy and advocacy process.

Promote adoption of 'Strategic' philanthropy addressing SDG

While the majority of the respondents from the private sector were involved in some form of CSR activities/charitable work; almost none of them had adopted a strategy to streamline CSR activities, measure performance and track impact. Strategically pooled and planned CSR fund from large private sector actors/foundations is becoming a key source of social development and SDG implementation plan around the globe. USAID/Bangladesh can also engage with Bangladeshi conglomerates in facilitating adoption of such strategic philanthropy approach.

PART C

Detailed analyses

Agri-business

(Focus area: Food processing)

Domestic Market Size	Export	Employment	2023 Market Size
USD 3.54B	USD 635 M	0.3 M	USD 8.23 B

3 Part C: Detailed analysis of the 16 sectors

3.1 Agro-processing

To consider increased outward orientation, the lens of analysis of agri-business sector in this report is focused only on the export-oriented agro-processing segments. It is worth mentioning that, BIDA also identifies agro-processing under the name agro-business.

Changing the momentum of urbanization due to global economic growth and dietary shift in both rural and urban clusters have transformed the structure of food/input system and market worldwide. As part of the food system, agro-processing has also confronted the transformation. FAO defines agro-processing as a subset of manufacturing and mid-stream off-farming activity which processes agricultural outputs into food, beverages, tobacco, textiles and clothing, wood products and furniture, paper products, and rubber products (FAO, 2017). The figure below illustrates the position of agro-processing in the core value chain of food/industrial inputs:

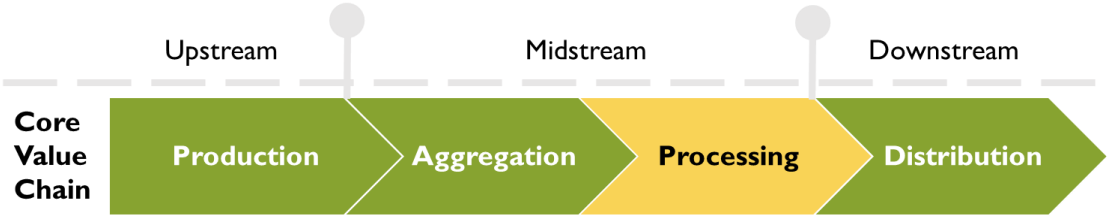


Figure 7: Global value chain of food/industrial inputs.

Under agro-processing, the focus of this report will center on consumable or edible food items which are processed from cultivated fruits, vegetables, and crops. The focused four major categories are **Dry food** (puffed rice, confectioneries, biscuits, potato-chips/flakes), **Frozen Fruits and Vegetables**, **Processed Fruits and Vegetables** (jams, jellies, pickles, canning, pulp, juices, sauces, and ketchup) and **Spices**.

3.1.1 Market size: agro-processing industry

Being a labor-abundant country, Bangladesh has always been considered as a potential growth spot for agro-processing industry (FAO, 2017). BAPA (Bangladesh Agro Processors' Association) claimed that the agro-processing industry has been enjoying remarkable progress during the past couple of years in both endogenous and exogenous market (The Independent, 2018). For an initial understanding of the agro-processing industry, this segment describes the overall industry including all agro-processing items.

Overall Market Size

Figure 7: Yearly size of agro processing industry by year

Referring back to Agricultural Value Chain Study of 2011 by USAID/Bangladesh, the estimated market size of agro-processing was $2.2 billion while the growth rate from FY 2004-05 to FY 2010-11 was 7.7 percent (Katalyst; Innovision, 2016). However, after 2011, no aggregated national market size estimation study was commissioned for agro-processing industry explicitly. Through qualitative investigations on export trends and insights from industry insiders, it has been observed that the market has seen a sharp inclination in both demand and supply-side after 2014. With a yearly growth rate of 15 percent from 2014 to 2018, the market size has reached approximately $4.81 billion, combining both domestic and export volume (Inspira Extrapolation, 2019). Rising dual-income households with increasing purchasing power has become one of the key driving factors for the growth of the agro-processing sector in the domestic market. The most immediate impact of this change has affected the sector because people are spending

more on *ready-to-cook* and *ready-to-eat* items. At the same time, rapid urbanization has also created a vacuum for *long-shelf-life/retort pouch*-based products in the domestic market (Future Startup, 2019).

3.1.2 Export growth potential

The sector has fetched export earnings of around $635 million in FY 2017-18. From FY 2012-13 to FY 2017-18, the export market has grown at a rate of 44.44 percent. Current statistics and growth rates indicate that the value of the agro-processing export market will cross $1 billion by FY 2019-20 where nation's apex trade body of agro-processors (BAPA) is also ambitious to achieve the target.

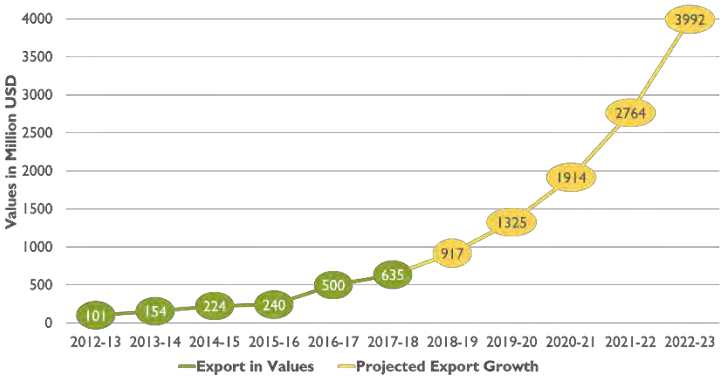


Figure 8: Export trend of agro-processing products by year.

Industry insiders have identified that the availability of raw materials, cheap labor and government supports were the key growth fuel behind the success. In the FY 2017-18, the major exported products were juice, drinks, puffed rice, snacks, spices, chanachur, biscuit, pickle, frozen vegetables, vermicelli, potato flakes/starch, jam-jelly, candy, mustard oil and flattened rice (Financial Express, 2018). At present such products are exported to 144 countries, however, the market is highly concentrated in a few specific places where either a large Bangladeshi migrant base is present (the Middle East and UK) or food pattern is similar due to cultural similarities (India).

The country currently has more than 400 food processing firms but only a dozen of them are export-oriented (BAPA, 2018). Among these exporters, the market leader (PRAN Group- one of the large conglomerates expanding factory across South Asia) alone has captured $333 million from the international market in FY 2016-17 which was approximately 66 percent of national agro-processing export earnings.

3.1.3 Employment

According to a leading agro-processing market player, approximately 300,000 people are employed in the processing sector. The growth of employment has been 15 to 20 percent per year (CAGR) for the last five years. As per LFS 2016-17 (Labor Force Survey- Bangladesh), the female employment proportion in the sector is around 22.86 percent[8]. According to *BIDS Study Report on the labor market and skill gap* in Bangladesh, the proportion of unskilled workers is 99.90 percent in this industry.

3.1.4 Government support

3.1.4.1 Fiscal incentives

- Cash incentives and export subsidies for selected export products ranging from five percent to 20 percent.
- 20 percent cash incentive is allocated for processing of locally produced fruits and vegetables.

3.1.4.2 Other government incentives

- Tariff-free access to the European Union.
- This sector has been prioritized in 2018-21 export policy.
- Able to take ESF fund which will provide eight-year term loans at two percent simple interest and is able to cover up to 49 percent of project cost (The Financial Express, 2018).

3.1.5 Environmental and compliance practice status quo

Among the food processing companies of Dhaka, Rajshahi, and Chattogram area, only 14 percent and four percent of enterprises are HACCP compliant and ISO certified respectively. Only 30 percent of the enterprises hold the certificate of BSTI[9] (BAPA, 2019). Processing companies are facing barriers in getting the certificate due to lack of knowledge regarding the issues and the complexity of the systems. Only two percent of the four hundred food processing

[8] Only contains female employment ratio of Food and Beverage products.

[9] Bangladesh Standardization and Testing Institute (BSTI): The country's standardization body which determines the national standard for any product and issues certificates after examining the quality of products.

companies use the wastewater treatment plant. Although a valuable organic fertilizer can be prepared from the waste material, none of the companies are using the waste material to prepare compost. (BAPA, 2017).

3.1.6 Future growth potential and challenges

3.1.6.1 Fruits: next growth fuel of the agro-processing industry

According to FAO, Bangladesh has maintained 11.5 percent annual growth in terms of fruit production for the last 18 years. Unfortunately, due to the absence of storage and processing capacity, Bangladesh wastes up to 45 percent of its fruit production as post-harvest losses every year. However, with an improved market system this loss can capture a significant amount of revenue from both domestic and international market (The Financial Express, 2018). A few selected fruits with high potential in export include the following.

- **Pineapple:** Recently Bangladesh has tapped into the global sliced Pineapple market. The national production of Pineapple has also grown by 11,000 tons in FY 2017-18 compared to last fiscal year which gave confidence to the market players. Many key informants were confident that the export of pineapple juice and the slice will be soared but due to global market price fluctuation, the export declined by 69 percent in FY 2017-18 (The Daily Star, 2018).
- **Jackfruit:** Processed Jackfruit along with soya foods have been considered as an alternative of red meat in the global vegan market while the global market will be $7.54 billion by 2025 (The Financial Express, 2018). Bangladesh has tapped in the market recently as a few companies have started exporting jackfruit-made osmotic dehydrated food and jackfruit seed powder in the EU market.

3.1.6.2 Biscuit: 3-fold growth rate in export earnings

Currently, the market size of biscuits and confectioneries is around $597-717 million which is growing at a rate of 15 percent annually (Light Castle BD, 2019). Around 100 auto and semi-auto biscuit factories are now operating in the country. The net export earnings of biscuits stood at $80.41 million in the first six months of the FY18-19, almost double of last year's earnings ($43.09 million) and is expected to triple in the next few years.

3.1.6.3 Potato: Wasting two million metric tons of export worthy potato

Vegetable exports have fetched $63 million in FY 2016-17 which is equivalent to 12.6 percent of total agro-processing export earnings (The Daily Sun, 2018). On the other hand, one of the staple foods potato is losing two million metric ton of export worthy surplus production every year where up to 70 percent value addition (one-kilogram potato worth $0.18 can earn $12.05 if it can be processed into flakes and chips) is possible in the domestic market with proper processing (Dhaka Tribune, 2019).

3.1.6.4 Low investment appetite beyond traditional sourcing region

Majority of the agro-processing industry is based in the Northern part of Bangladesh. Due to the absence of basic infrastructure and resources, the agro-processing industry did not invest in other potential zones. Being limited to a specific region, the agricultural output produced in other region cannot be mobilized under the processing industry. Fruits and cash crops from Chattogram and large-scale mung production from Barishal can be portrayed as an example of such a case (Katalyst; Innovision, 2016). However, industry insiders believe Jamalpur Economic Zone (an EZ situated in Northern Bangladesh) can be utilized as a border economic zone for agro-processing following the growth blueprint of Food Innopolis[10], Thailand. Food Innopolis is an exclusive hub designed for the food industry which promotes research and innovation.

Case Study: Chattogram Hill Tract (CHT) Agricultural crops | The untapped oasis

The CHT region is situated in the South-Eastern parts of Bangladesh which consist of three districts named Khagrachari, Rangamati, and Bandarban. CHT's land has a congenial agro-climatic environment for growing a number of high-value cash crops (spices, herbs, nuts, ginger, turmeric, and cashew) and fruits (pineapple, mango, papaya, orange, banana, and jackfruit). In 2015, CHT alone produced more than 150,000 metric ton of mango, jack fruit and litchi (IJSAR, 2019). On the contrary, the region **has virtually no food-processing industry** (FAO 2013). On an average, a substantial amount of fruits and vegetables are being wasted per season as there is no cold storage facility in the hill tracts (Rangamati Chamber of Commerce and Industries, RCCI, 2019). Political movement/conflict in the region is also having

[10] To learn more, please visit: http://foodinnopolis.or.th/en/home/

considered a major hindrance. The area is an ethnically, culturally, and topographically diverse region of Bangladesh with 12 ethnic communities with distinct tribal cultures and traditions. The ethnic minorities in this region have the potential to engage in entrepreneurial activities and developing trading and business relationships. Processing, packaging, branding of farm-based produce and service delivery- all have potential as ethnic food-processing enterprises (ICIMOD, 2016).

3.1.6.5 Import dependency of packaging materials and machinery

The Industry is also import-dependent for packaging materials of the processed foods. Processors import sanitary cans from Thailand, returnable bottles from India and crown caps from Sri Lanka. Lug cap for jam jelly bottles is imported mainly from India to cater the local demand. High-end sophisticated machinery such as vacuum fryer is also imported as only light machinery is produced in Bangladesh.

According to a leading export-oriented processing company, of the total produced processed food, 70 percent of the raw materials are sourced locally and the rest 30 percent (packaging and other chemicals) are imported from abroad. Case of fuel import for running the processing plants are also found in the industry.

3.1.6.6 Quality control and assurance

The global market has been always concerned about the quality of processed food. To be a global exporter, Bangladesh has to diversify the portfolio of its consumer. Countries in an advanced economy follow certain standards to maintain the quality of processed food/vegetables. To operate in such a market, Bangladesh has to ensure the quality according to the standard. However, the current situation of the industry indicates, in the case of processed food quality management in both endogenous and exogenous market, Bangladesh has lagged behind in terms of resources and logistics (The Financial Express, 2017). As indicated by key informants of this research, one of the most pressing concerns for the agro-processors is perhaps the food safety issue. Due to the absence of quality testing in national boundary, Bangladeshi processed food items required third country scanning which put up to 65.5 times of extra cost burden on exporters (The Daily Star, 2017). Moreover, the presence of lead in the turmeric powder and pesticides and formalin in mango juice has reduced consumer confidence in some products and the processors have seen a decline in sales of these products nationally.

3.1.6.7 Lack of a nodal agency[11] for agro-processing sector

There is no dedicated nodal agency/body to look into the development of the sector, considering the multi-billion-dollar global food-processing business and its direct benefit to the farmers. According to BAPA, entrepreneurs have to visit different ministries, including industry, agriculture, food, and commerce, to get things done (The Financial Express BD, 2017). Export peer like India has a dedicated ministry to supervise food processing industries named Agricultural and Processed Food Products Export Development Authority (APEDA).

3.1.6.8 Promoting local starch

Compared to 2017 with 2016, the cassava production has increased by close to 200 percent but still, it can hardly meet two percent of local demand (The Daily Star, 2019). In 2012, ADB has sanctioned a loan worth $25.1 million to a local conglomerate to develop starch value chain in Bangladesh including farming and production promotion (ADB, 2019). Due to lack of high yield variety, local production of starch is not growing up. Private actors expressed dissatisfaction as BARI has not been able to deploy researchers and develop high-yield cassava variety as experts in the Philippines and India had done.

[11] Nodal Agency: A government or state agency, sometimes an appointed commission, is a permanent or semi-permanent organization in the machinery of government that is responsible for the oversight and administration of specific functions

Automotive/bus/truck assembly

Domestic Market Size	Export	Employment	2023 Market Size
USD 13.89 B	USD 1.5 M	0.05 M	USD 32 B

3.2 Automotive/truck/bus assembly

With growing MAC population coupled with improved living standard, the demand for the automotive industry outputs is increasing significantly. Over the last two decades, there is a visible indication that the automotive industry of the country is developing gradually. The industry has traditionally been dominated by imported vehicles (CBU), however, since the last decade; the local companies have ventured into a foreign collaboration to shift interest from CBU to Semi Knocked Down (SKD) and Completely Knocked Down (CKD) units.

3.2.1 Structure of the industry

Because of the limited domestic source of raw materials and underdeveloped backward linkage value chain, the industry is yet to boom to its full potential. **Automotive/bus/truck assembly sector** consists of two-wheeler and four-wheeler vehicles such as motorcycles, private vehicles, and commercial vehicles (Bus, Truck, school bus, dump truck, and pick up, three-wheeler).

The automotive assembly is a capital-intensive industry, which makes it difficult for the small and medium enterprises to be a part of it. Hence, there is no presence of SMEs in assembly sub-sector. Yet, there is a growing presence of SMEs in parts, accessories, backward linkages and repairing verticals of automotive. In addition, the value chain of the automotive assembly industry crosses its verticals with sectors such as plastic, light engineering, and leather as its value chain support.

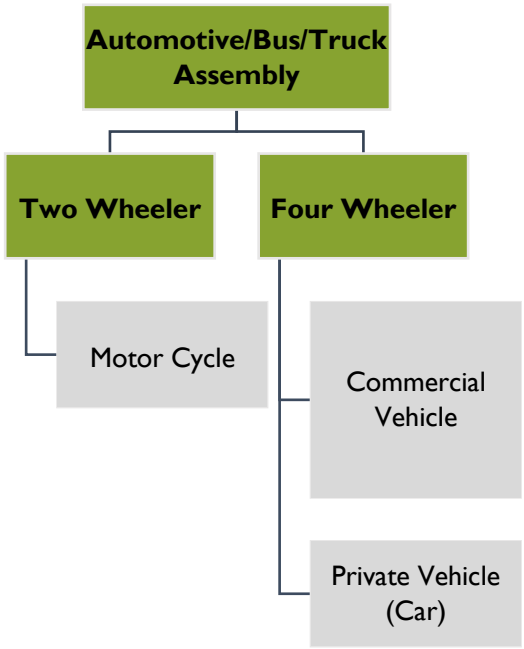


Figure 9: Automotive market structure

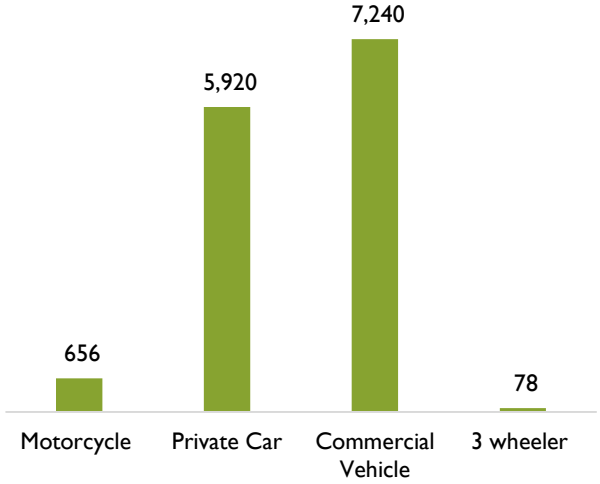


Figure 10: Bangladesh automotive industry market size, in million

3.2.2 Statistics representing the industry

The current domestic market size for the automotive industry is approximately $13.89 billion with an average positive CAGR of 21 percent in the last five years. The commercial vehicle market holds the highest market share worth more than $7 billion. The private vehicle is placed second with a total market size worth $6 billion. The market size of the motorcycle and three-wheelers are $656 million and $78 million respectively. However, the motorcycle industry is expected to go through steep growth in the next few years. With a similar growth trend, the industry is expected to reach $32 billion at the end of 2023 (Inspira extrapolation, 2019).

Assembly plants being automated do not require a lot of employees in the factories. There are approximately 5,000 employees directly connected to the factory level work and 50,000 employees in the post-production process (Bangladesh Bureau of Statistics (BBS, 2017) such as retailing, repair shop.

3.2.2.1 Motorcycle:

The current market size of Bangladesh motorcycle industry is approximately $656 million with 32 percent average growth from 2015 to 2018 (BRTA, 2018). With more than 400,000 motorbikes sold in 2018, the subsector is expected to reach $3 billion by 2023 (Inspira extrapolation, 2019). The local production of the motorcycle has begun since early 2,000 and currently, more than 10 local companies are establishing SKD and CKD facilities such as Runner, Nitol Niloy, Rancon, Uttara motors, PHP. (Daily Star, 2018), mostly in association with foreign JV (Joint Venture) partner.

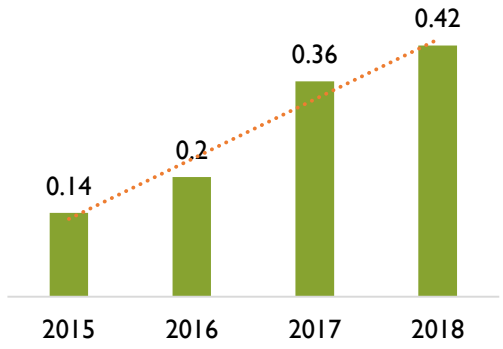


Figure 11: Growth of motorcycle sales, in million units

*Figure SEQ Figure * ARABIC 12: Growth of motorcycle sales in millions*

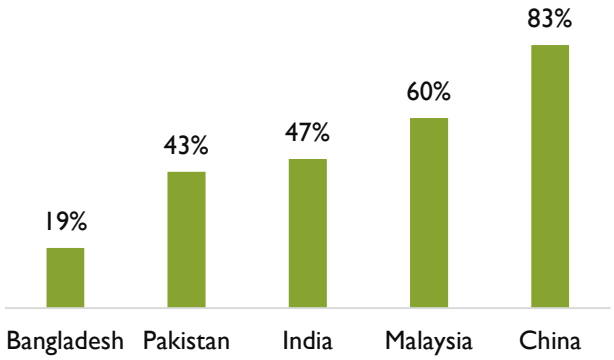


Figure 12: Motorcycle penetration in regional peers

At the same time, only around 19 percent of households in Bangladesh own motorcycles, which is substantially lower than that of regional peers such as India- where 47 percent of households have bikes or China- where 60 percent of households own a motorcycle. (Daily Star, 2018). This further reinforces the fact that how the local motorcycle market will grow at a break-neck pace in the next decade.

Not many local companies are envisioning export market entry but one particular Bangladeshi private firm, *Runner* has exported 1,000 units of motorcycle in Nepal very recently and plans to send 3,000 units every year (IDLC, 2017). At the same time, *Runner* is targeting other emerging markets in Africa such as Nigeria and Zimbabwe along with Asian markets such as Thailand and Cambodia. Interestingly, the same company has been successful in high domestic value addition of 50 percent upon sourcing plastic mold, chains, chassis, seats locally from Dinajpur and Faridpur. This indicates that local companies with the incentivized strategies and market research are able to penetrate the export market while creating a positive ripple effect on the domestic light engineering enterprises/component vendors.

3.2.2.2 Private vehicle:

With around 33,000 additional private vehicles (cars) registered in 2018, the current car market size is approximately $6 billion (The Daily Star, 2018). The private vehicle segment is growing with 15 percent positive CAGR and expected to reach $12 billion in 2023 (Inspira extrapolation, 2019). Unfortunately, the sub-sector is mostly dominated by CBU import. Hence, the local value addition and employment generation is comparatively lower. Japanese brands dominate the reconditioned import market with 88 percent market share (The Daily Star, 2018). Even though

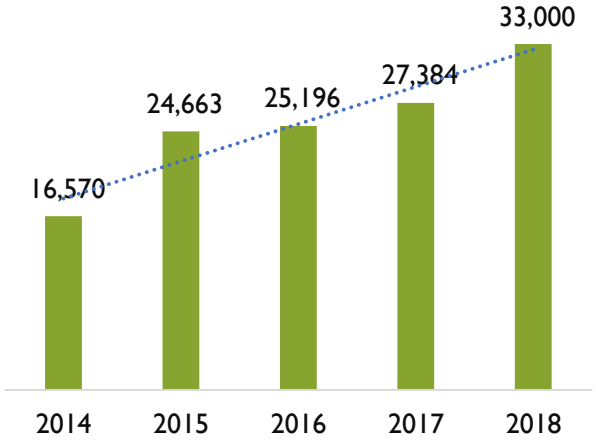


Figure 13: Registration of private vehicles

there is a lack of local car manufacturers, a state-run company named *Pragoti Industries* has been manufacturing vehicles for Japanese company Mitsubishi since 2000. On the bright side Indian, Malaysian and Korean manufacturers such as Tata, Proton, Hyundai are strategizing to launch assembly plants with local partners. *PHP Automobiles Ltd*, a business conglomerate based in Chattrogram, has already joined with Malaysian automotive manufacturer *Proton* to manufacture 1,200 cars per year. *PHP-Proton* collaboration has manufactured 120 units of the private car which are running successfully on the street. The company invested $450 million in the project employing 250 employees including 50 engineers (The New Age BD, 2017). With the rise of locally assembled cars, average cost of private vehicles will decrease and middle-income consumers will be able to invest which will eventually lead to further growth of the subsector.

3.2.2.3 Commercial vehicle:

At present, the market size of commercial vehicle is more than $7.2 billion with a 16 percent positive CAGR in the last five years (BRTA, 2018). At least 55,000 units of commercial vehicles such as bus, truck, cargo van, human-hauler, pickup, and tanker were sold in 2017 (BRTA, 2018). The commercial vehicle market has been dominated by 5-7 local distributors of Indian CBU units until the last few years: local companies such as *Nitol* has 40 percent market share*, Ifad Auto* holds 38 percent and *Runner Motors* holds 10 percent market share (IDLC Finance, 2017). The vehicles are imported mostly from India mainly due to competitive pricing and availability of spare parts.

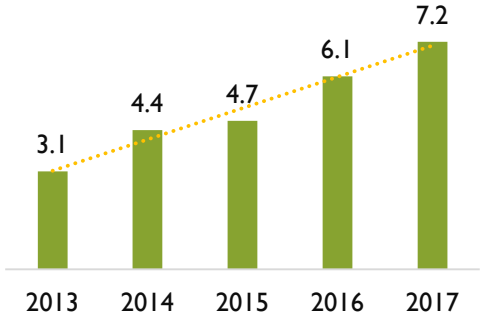


Figure 14: Commercial vehicle, in billion

Three-wheelers: Bangladesh has been producing auto-rickshaws and battery run vehicles since 1980 along with manufacturing locally designed three-wheeler motor vehicle utilizing engines from Honda. The market size of three-wheelers is approximately $80 million with a demand of 20,000 units per year (BRTA, 2018).

Investment:

The total FDI in vehicle and transportation equipment was reported to be $2.81 million in FY 2016-17 (Bangladesh Bank, 2016). The contribution of foreign direct investment adds more value in terms of knowledge sharing and technology transfer compared to the money itself. Almost all FDI happened through a joint venture or collaboration with locally owned companies. Among the recent investments, the major collaboration happened with Niloy-Hero MotoCorp, PHP-Proton, IFAD-Ashok Leyland. Hero MotoCorp and Nitol Niloy group jointly invested $35 million in Jashore factory. The production started in 2017 and Hero MotoCorp owns the 55 percent of the manufacturing plant and rest 45 percent is owned by Niloy Motors (Dhaka Tribune, 2016). *PHP-Proton* collaboration invested $450 million in Chattrogram factory (The New Age BD, 2017). Uttara Motors have invested $250 million jointly with Bajaj, Suzuki, Force, Isuzu, factory located in Ashulia, Dhaka to produce motorcycle (Daily Star, 2019). In addition, Hyundai plans to make $450 million assembly plant in Chattrogram with the capacity to produce 1,200 units of cars annually (Daily Star, 2018).

3.2.3 Support system to boost the industry

Fiscal support

- **Cash incentive:** 10 percent cash incentive on motorcycle export
- **Tax holiday:** Automotive industry is allowed for Tax holiday in industrial undertaking and physical infrastructure facility established in between 1st July 2011 to 30th June 2019, by establishing certain conditions.
- **VAT exemption for import:** 100 percent VAT exemption and lowered supplementary duty on imported parts and components for the purpose of motorcycle manufacturing.

Presence in relevant policies of the government

- **Presence of sectoral Roadmap:** The Automotive Policy Guideline and Roadmap 2012-2021 was published by the Ministry of Industries (MoI) aiming to boost the local automotive manufacturing sector. The policy guidelines emphasizes on developing trading companies gradually as well as focused on assembling and manufacturing units such as SKD and CKD and gradually shift from CBU (Daily Star, 2019).

- **Presence in BIDA's potential sector list:** Similarly, even after capturing the highest volume of market size, the automotive industry is not added in BIDA's potential sector list. On the other hand, the similar manufacturing industries such as shipbuilding and light engineering are present in BIDA list.

- **Presence in the industry policy 2016:** Automotive manufacturing and repairing have been added in the Industry Policy 2016 as '*priority sector* for special development'.

- **Presence in the economic zone:** The sector is present in the planning of four economic zones named: Mirershorai Economic Zone, Abdul Monem Economic Zone (AMEZ), Meghna Industrial EZ and Arisha Economic Zone,

Other support

The government has framed a policy to facilitate the development of the motorcycle manufacturing industry in 2018 to meet the domestic demand for low-cost mode of transport as well as to expand the export basket. A strong preference has been given to the favored development of the government's current assembling units, more private investment in motorcycle manufacturing and heavy vehicle assembling and collaboration with foreign companies. The policy has also targeted to locally manufacture five lakh motorcycles a year by 2021 and double the number by 2027 (Daily Star, 2019).

3.2.4 Sustainability of the ecosystem

3.2.4.1 Inclusion

The majority of the employees are male in the automotive industry. Less than three percent of the workers involved in the factory level work are women and approximately 12 percent of the workers involved in post-production activities such as marketing, sales, and management office- are women (Inspira extrapolation, 2019). Most automotive factories consist of 80 percent blue-collar employees among which most of them start as unskilled and gets in the house on the job training. The unskilled inclusion of the industry is approximately 84.70 percent (SEIP, 2017). There are less than 20 percent white-collar employees in the industry positioned in the management and as engineers. At the same time, almost in every company, there is a presence of around five to seven foreigners in top management level mostly from India, Taiwan, and China.

3.2.4.2 Environment

The automotive production process leaves a moderately negative footprint in the environment resulting in because of materials like steel, rubber, glass, plastics, paints. Which must be used even before a new ride is ready for the street. For such reasons, the industry falls under "Orange - B" category in *Environmental Clearance Certificate,* where the industries have to report on the *Environmental Management Plan (EMP)*, the Process Flow Diagram, Layout Plan of Effluent Treatment Plant and information about its effectiveness and no objection certificate from the local authority. Fortunately, the key players of the industry have referred that due to government regulation most factories of Bangladesh adopted environment sustainable practice in the work process.

Future prospect in Electric Vehicle by Nitol Motors

Globally, the electric car market share is on the rise. The global electric vehicle market was valued at $118 billion in 2017 and is projected to reach $567 billion by 2025, growing at a CAGR of 22.3 percent from 2018 to 2025. An electric vehicle uses chemical energy stored in rechargeable battery packs instead of fossil fuel to propel it. According to Forbes, Chinese automakers churned out 680,000 all-electric cars, buses, and trucks in 2017, more than the rest of the world combined. China produced more than 200,000 all-electric commercial vehicles last year, amounting to nearly five percent of the total output of the world.

Nitol Motors is set to come with a locally-assembled electric vehicle in 2020, a big stride for Bangladesh's fledgling automotive industry. Nitol's model, which will be called *Suvare*, will be the size and feel of regular cars and will cost about $15,000. The maximum speed of the car will be 150 km/hour and with half an hour's charge, *Suvare* can run up to 200 km. *Suvare* will be very cost-effective and environmentally friendly.

Source: Retrieved from daily star news titled "Locally assembled electric cars to hit streets soon" written by Mr. Jagaran Chakma published on January 24, 2019, sourced from the link https://www.thedailystar.net/business/news/locally-assembled-electric-cars-hit-streets-soon-1692118

Ceramic

Domestic Market Size	Export	Employment	2023 Market Size
USD 668.54 M	USD 52 M	0.048 M	USD 1.56 B

3.3 Ceramic

In the last ten consecutive years from 2008 to 2018, the ceramic industry of Bangladesh has achieved approximately 200 percent growth in production capacity. Based on endogenous and exogenous market analyses/projections, sector insider believes that ceramic industry is one of the key potential sectors which will lead national export earnings in the near future (The Daily Star, 2017). Among different types of ceramic products, Bangladeshi manufacturers are concentrating on producing traditional ceramics such as *Tableware, Sanitaryware, and Tiles*.

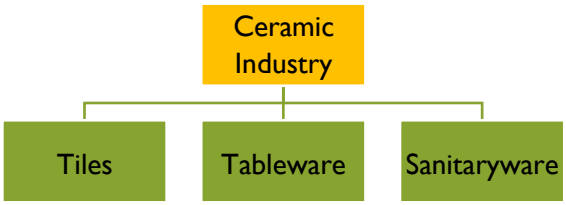


Figure 15: Market structure

3.3.1 Statistics

Table 2: Number of active companies and aggregate production capacity by subsectors

Subsectors	Number of Manufactures	Aggregate Production Capacity
Tableware	19	250 million pieces.
Tiles	28	20 million square meters.
Sanitaryware	18	7.5 million pieces.
Source: (The Daily Star, 2017)		

Over the last decade, the industry has witnessed a multi-dimensional growth in both domestic (*Average annual growth rate =20 percent*)[12] and export market (*CAGR* $_{last\ six\ years}$ *=seven percent*)[13] . While tiles items (floor and wall tiles) are ruling over domestic market, tableware items (dishes and dishwares) are ruling over international market. Real estate industry is the main growth fuel of domestic market growth while US-China trade war and rising European demand are bringing growth in the export market. With similar growth trend, the industry is expected to reach 1.56 billion by the end of 2023.

3.3.1.1 Domestic market

Table 3: Total national consumption including import values and local of ceramic by subsectors

	Tableware	Tiles	Sanitaryware
Total National Consumption	$56.09 million	$512.76 million	$99.69 million
Local production	$53.58 million (96%)	$395.76 million (77%)	$88.42 million (89%)
Imported	$3.18 million (4%)	$117.00 million (23%)	$11.28 million (11%)
Source: BCMEA database.			

[12] (http://www.theindependentbd.com/post/124644, 2018), Published in The Daily Star.

[13] Export Promotion Bureau, Bangladesh.

The industry has started its journey in 1958 and currently caters to 87 percent of domestic demand, worth $668.5 million. At present, there are over 65 percent ceramic manufacturers in the country producing products such as clay jars, clay flower pots, bathroom fittings, dinner sets, tea sets, coffee mugs, clay jewelry (The Independent, 2019). The country can cater 96 percent of tableware, 77 percent of tiles and 89 percent of the sanitary ware demand through local production.

3.3.1.2 Export market

Figure 16: Export Trend of Ceramic Industry (in Million).

Riding on diversified tableware items especially in the industry's export segment has gone up manifold over the last six years. In FY 2017-18, the export earning was approximately $52 million whereas the projected target was $43 million. The industry has an export footprint in over 50 countries with export valued at $52 million in FY 2017-18 (The Independent, 2019). US-China trade war is one of the major catalysts which have brought $9 million fortune to the industry, continuing the trend; the export volume is expected to rise more. In the first two consecutive quarters of the current fiscal year, the industry has made a new record of achieving 300 percent growth rate in export value compared to last corresponding quarters (The Daily Sun, 2019).

Along with the growing domestic and international market, the ceramic industry has also enjoyed exponential growth over investment accumulation. With a 70 percent growth in the last four years, the total accumulated investment was $1,051.77 million whereas, it was $619.38 million during 2014 (IDLC Business Review, 2015). On account of such investment growth, it is expected that 20 new companies will join the fleet of the ceramic industry in the next few years. At the same time, current manufacturers are also focusing on production expansion to grab rising opportunities (The Daily Star, 2017). According to BCMEA, export-oriented tableware segment holds 20 percent, tiles hold 59 percent and sanitary ware holds 16 percent of the total accumulated investment.

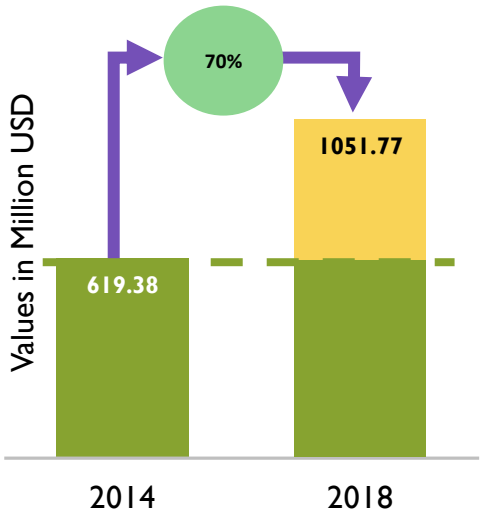


Figure 17: Investment Accumulation Trend of Ceramic Industry.

3.3.2 Support

Government supports:

- 10 percent cash incentives on export values.
- Considering LNG (Liquefied natural gas) as an alternative to natural gas to solve energy problems.
- Promoting industry as a prioritize sector to attract foreign investment.

Ecosystem actors

- Bangladesh Institute of Glass and Ceramics (BIGC) have conducted research on course development and facilitate skill-oriented education to provide guidance for human resource development.
- To develop human capital, Bangladesh Institute of Glass and Ceramics (BIGC), Bangladesh Ceramic Manufacturers and Exporters Association (BCMEA) and BRAC have conducted research studies on ceramics production where core focus was human resources.
- A project called HEQEP under the University Grants Commission (UGC) of Bangladesh has been implemented to establish a bridge between the academicians and the industry which aims to develop new technologies to be used by the industry to spin-off the new product.
- The Department of Glass and Ceramic Engineering (GCE), BUET is working in a project along with the local private company, Shinepukur Ceramics Ltd. for the fabrication of ultra-lightweight, a heat-insulating ceramic fiber that will have the tremendous energy-saving capability. They are also developing a bullet-proof ceramics vest.
- Department of GCE, BUET and DBL Ceramics has partnered to initially develop metallurgical grade silicon by melting sand and has targeted to develop solar-grade silicon through extensive research and development.

3.3.3 Sustainability

Employment inclusion

The ceramic industry is currently employing over 48,000 employees. The number of white-collar employees in the industry is over 10 percent of the total number which is around 4,800. The sector employs over 500,000 people directly and indirectly with a 40 percent share of women in the workforce (IDLC Business Review, 2015). Due to the involvement of interlinked industries such as real estate and construction, the indirect employment is approximately 10 times higher compared to direct employment. In terms of the job multiplier effect of the industry, with a change in demand of $1 million, ceramic industry can generate 216 additional jobs.

Table 4: Number of employees directly working in each sub-sector of the industry

	Tableware	Tiles	Sanitaryware
Number of direct employment	18,800	19,750	9,650

3.3.4 Opportunities

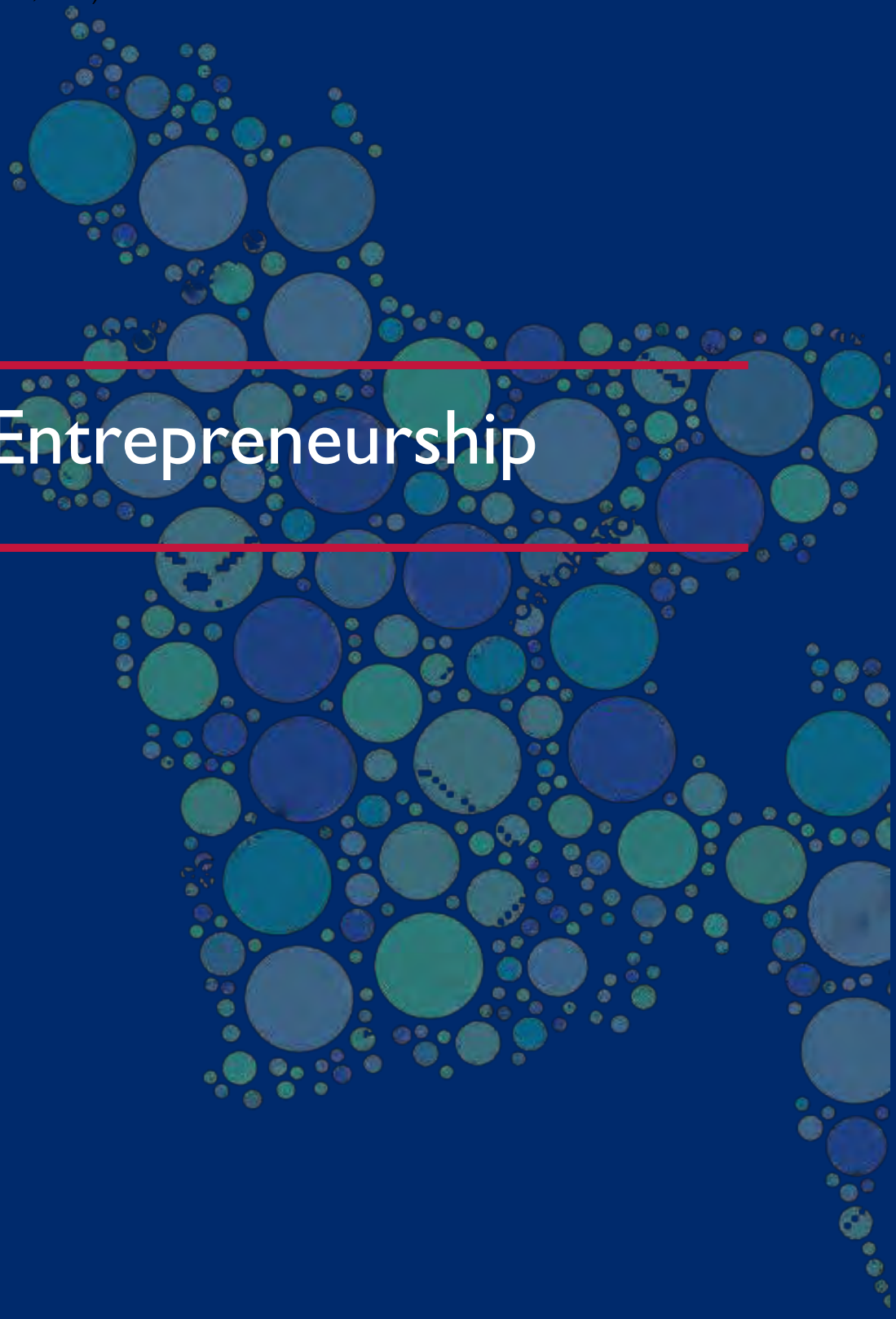
Industry-academia collaborative research: The global ceramic industry is growing at a very fast pace and introducing different usage of ceramics in other industries. Keeping that in mind, in recent years, industry-academia collaborative research has started in Bangladesh to develop new technologies under a project by Higher Education Quality Enhancement Project (HEQEP) of the University Grants Commission (UGC). A local manufacturer such as Shinepukur Ceramics Ltd is working on developing ultra-lightweight, heat-insulating ceramic fiber in collaboration with the Department of Glass and Ceramic Engineering (GCE), Bangladesh University of Engineering and Technology (BUET). Moreover, DBL Ceramics is working with BUET academicians to develop bullet-proof jackets where the plate will be made of ceramics.

Duty-free market access: Due to US-China trade war, in the shadow of extensive tariff rate, countries like Bangladesh has become a suitable choice for investors to expand their ceramic businesses. Even China's ceramic products are paying 12 percent tax to operate in the European market, where Bangladesh has duty-free access in EU market. Such opportunities are indicating the industry's future growth potential (The Independent, 2019).

3.3.5 Key concern

Natural gas is one of the key sources of energy for the ceramic industry. In Bangladesh, natural gas usually does not contain *Sulphur* which gives the advantage to make brighter ceramic products. Since the national natural gas reserve is falling down drastically, energy scarcity has become one of the key concerns for the industry to produce better quality products. One of the market leaders had to count a loss worth $25 million because of gas shortage in last fiscal year. The government has planned to provide LNG to ceramic manufacturers to mitigate the shortfall, but the supply is delayed due to slow construction of the pipeline. However, the price hike (BERC sought up to 372 percent hike for six

sectors) of imported LNG will increase the cost which will hamper the competitive pricing of Bangladeshi products in the international market (The Daily Star, 2017).



Entrepreneurship

3.4 Entrepreneurship

"Entrepreneurship development" itself as a sector is quite nebulous and broad. The assessment team, therefore, will focus on the state of digital entrepreneurship (e.g. "start-ups") in Bangladesh, its promise, the challenges that lie ahead and potential opportunities for USAID.

Entrepreneurship, driven by ICT and IT enabled business models, is considered to be one of the booming industries in Bangladesh. Technological change and innovation have always been critical to improve productivity and economic growth. This is particularly true for an economy like Bangladesh that is dependent on only a handful of drivers, namely textiles, remittances and informal services, which in turn are reliant on cheap, low-productivity physical labor. Digital inclusion can help diversify the economy, attract new types of dynamic investment, engage young people and unleash their talents that contribute vastly to become a middle income country. This is evidenced by the fact that, the IT software and services sector is growing by about 50 percent per year in revenue and now employs more than 70,000 people, according to AT Kearney, a consultancy.[14] They also estimate that about 200 digital start-ups are launched each year in Bangladesh.

In recognition of this, the government has made digitization a central pillar in Vision 2021.[15] Guiding documents such as the National ICT Policy 2009, which outlined more than 300 action items over the short-term, medium term and long term to achieve Vision 2021, is a testament to the government's resolve.

3.4.1 Key sector milestones

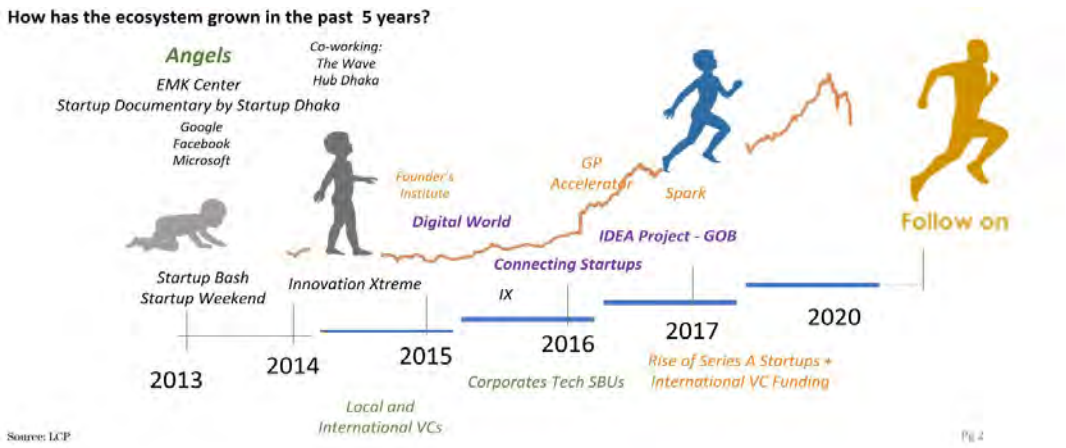


Figure 18: Sector milestones of digital start-ups in Bangladesh

The figure shows growth trend of the digital entrepreneurship ecosystem in Bangladesh in its modern iteration from 2013 onwards. What began as a series of ad hoc, mostly day(s)-long events has become a full-fledged ecosystem with full-time incubation and acceleration programs, a mushrooming of co-working spaces and the influx of venture capital from both domestic and international sources, along with notable case studies of start-ups that have grown in scale and have attracted significant investment. 2021 is expected to be another milestone when Bangladesh's per capita income is supposed to match or even eclipse those of neighboring India.[16] This would have implications across the economy, including and especially in the consumption of digital services, enabled by increasing smartphone penetration and data usage.

[14] https://www.banglalink.net/sites/default/files/static/files/Digital_Entrepreneurial_Ecosystem_in_Bangladesh.pdf

[15] https://www.thedailystar.net/supplements/24th-anniversary-the-daily-star-part-1/digital-bangladesh-dreams-and-reality-73118

[16] https://www.thefinancialexpress.com.bd/economy/bangladesh/bds-per-capita-income-may-overtake-india-in-three-years-1527575361

One example is online shopping: The rollout of 3G internet in Bangladesh around 2013/2014 led to the rapid adoption of online shopping here, according to the Economic Times.[17] Bangladesh's e-tailing sector was expected to grow by 70 percent in 2017, and by that year internet penetration to 40 percent of the population has bolstered the growth of local e-commerce sites, along with 10,000's of f-commerce (Facebook-based) merchants and e-grocery startups such as Chaldal, backed by famous international investors such as IFC, 500 Startups and Y Combinator. Yet the size of Bangladesh's e-commerce market at that time was estimated to be only $110-115 million when India's own e-commerce market was estimated to cross $17 billion.[18] But by 2020/2021, this sector in Bangladesh is estimated to see exponential growth, based on assumptions about the portion of GDP attributed to e-commerce using India as a barometer. An oft-cited number is $20 billion, attributed to Goldman Sachs.[19] Such growth creates strong headwinds for start-ups in this sector and those companies involved in their supply chain including logistics.

According to AT Kearney, there are five primary drivers of the digital ecosystem in Bangladesh. #4 and #5 are covered extensively in the rest of this section.

Table 5: Drivers of the digital ecosystem in Bangladesh

#1 Expanding Consumer Market	• Young populations of the country are eager to embrace digital services. • Consumer spending is rising 11 percent annually (reaching $1,015 in 2016).
#2 Rising Internet use	• The number of active internet connections has increased from 36 million to 90 million in between 2013-2018 (20 percent CAGR).[20]
#3 A young urban population with an appetite for digital services	• 34 percent of the population lives in urban areas and about 45 percent are under the age of 25 (2016).
#4 Positive government action	• National ICT Policy 2009. • Digital Bangladesh Strategy 2021. • National Digital Consumer Policy. • LICT Project. • IDEA Project / Fund. • a2i.
#5 A growing support network	• Dozens of business incubators and accelerators providing business programs, coaches, mentors, and co-working spaces, with more in the process of being established. • Foreign and domestic investors. • New angel investment network. • Business plan competitions, conferences, and hackathon. • Donors supporting startups.

3.4.2 Incubators and accelerators

Since the launch of Grameenphone Accelerator in 2016, the number of full-time incubators and accelerator programs has mushroomed. All three telcos now have accelerators, with Banglalink the third largest telecom operator partnering up with the ICT Ministry for its incubator for outside start-ups, while Robi the second largest telecom operator has focused its r-ventures on supporting employee-led ideas that can be spun off as businesses. Private universities are also

[17] https://economictimes.indiatimes.com/small-biz/startups/features/global-investors-heading-to-india-are-beginning-to-make-a-stopover-at-bangladesh/articleshow/61678920.cms

[18] Ibid.

[19] https://idlc.com/mbr/images/public/hPqVdqDxw1d36dRsjxGrbN.pdf

[20] https://www.thedailystar.net/business/internet-users-bangladesh-over-9-core-active-1636477

generating innovative ideas like BRAC University is having its own incubator for student start-ups. Daffodil and ULAB are also looking to start their own. On the impact side, there are at least five, including ygap (run in partnership with Impress Group), YY Goshti (run with support from Yunus Centre and EMK Centre), BRAC, Scaleup Bangladesh (with support from IFC), Toru (supported by Porticus Foundation, Standard Chartered) and Lightcastle Partner's Farmers Hub incubator (run with support from Syngenta Foundation and DFID). There is also Startup Bangladesh, which is operational under the ICT Ministry. The following table is a comparison of the selected platforms of entrepreneurship and their modalities:

Table 6: Comparison of initiative catering Digital Start-ups

Entrepreneurship Facilitation platform	**Seed grant**	**Incubation Services**	**Acceleration**	**Due Diligence (Value Addition)**	**Deal Negotiation**	**Investment**	**Follow up and Exit**
EMK	4-5K BDT	3-month incubation service via YYGoshti, online training via Startup Nexus	NA	Registration, business traction,	NA	NA	NA
GP Accelerator	NA	NA	Office space, defined curriculum, mentors	Huge emphasis on online / digital traction	Flat negotiation – take it or leave it	1M BDT for 8% flat	Minimal
Startup Bangladesh	1M BDT grant	NA	Office space	NA	NA	NA	NA
Toru	1M BDT grant	Impactor – 6 months of business design and piloting	Access to specialist mentors, especially in the field of sales	Emphasis on human-centered design, access to an angel network	Takes <5% equity stake in the companies in acceleration	No direct investment, but facilitates	Continual monitoring; no timeline but at least up to five years
Scaleup Bangladesh	NA	NA	Three-week accelerator followed by one year follow up	Business model canvas, finance, partnerships	Takes an equity stake in companies	No direct investment, but facilitates	Continual monitoring for top 10-20%
ygap Australia	40K – 1M BDT	NA	1 week accelerator followed by 6 month follow up	Impact measurement, theory of change/strategy	Impact first	2.5-5M BDT for 10-30%	Up to three years for investee companies
Banglalink Incubator	NA	Office space, access to Banglalink mentors	NA	NA	NA	NA	Minimal

Despite the proliferation, entrepreneurs are still clamoring for more support with business development, legal and tax issues, and investment readiness, as shown by the AT Kearney Report:

Few organizations currently exist to support/address these needs in a comprehensive way, and those that exist are relatively new and have minimal reach, working with only tens of start-ups at a time.

Key areas of need include:

o Aggregation/networking/knowledge sharing amongst cohorts

o Training in key business management areas

o Linkage to investors

In general, there is a significant lack of structure of the programs (starting with the selection process and the needs analysis) and guidance for entrepreneurs as well as for involving mentors and specialist experts.[21] This could be also explained by the limited available resources of these organizations. On the impact side, only a selected few organizations are consciously measuring and tracking the impact of these enterprises in a systematic manner.

3.4.3 Investment and fundraising

One of the significant developments has been the influx of domestic and foreign venture capital into the start-up ecosystem in the last five years, with at least $280 million in aggregate deals in that time period. Some of the deals include for companies, often led by Bangladeshi expatriates in US/Europe that have significant back-office functions in Bangladesh. This will undoubtedly increase in the coming years, led by domestic financial institutions that have obtained alternate investment licenses to engage in venture capital and private equity, including IDLC-, the largest non-banking financial institution in the country and others with a local focus include companies in the consumer space. Some of the marquee deals include:

Sector	Company	Raise
Media	Newscred	$90M to date
	Bongo BD	$1M from Razor, Bangladeshi angels
Health	Augmedix	$40M to date
Ecommerce & Marketplace	Zero Gravity	$5M from Frontier Bangladesh (Brummers & Partners)
	Doctorola	$500K from BD Venture, Bangladeshi angels
	Chaldal	$9M+ from IFC, IDLC, US-based angels, 500 Startups (US)
	Direct Fresh	$1M from BRAC, Razor
	Ajkerdeal	$2M from Innotech
	Sheba	$2M from Epyllion Group (local conglomerate), B'deshi angels
Job Portal	Bdjobs	$15M to date from Seek.com.au

Sector	Company	Raise
BPO	Brain Station 23	$250K from IPE (UK), BD Ventures, Oracle
	GPIT	$10M for 51% stake to Accenture
Payments & Fintech	Cloudwell	$2M from Aavishkaar (India-based impact investor)
	Bkash	$56M to Ant Financial (Alibaba China) Began with impact investments from Gates Foundation, IFC and BRAC
	Surecash	$7M from Osiris (Hong Kong)
Ride-Sharing	Pathao	$12M+ from Go-Jek, angels
	Shohoz	$15M from Golden Gate Capital (Singapore), 500 Startups (US), Linear VC Previous investments by Brummers & Partners

Figure 19: Investment raised by different start-ups

[21] KII with the Roots of Impact team for Swiss Development Cooperation

But divided over five years ($56 million), this represents less than 2.5 percent of the annual FDI in the country, which in turn is less than one percent of GDP. Not only that, there is a huge early-stage funding gap for impact enterprises in Bangladesh:

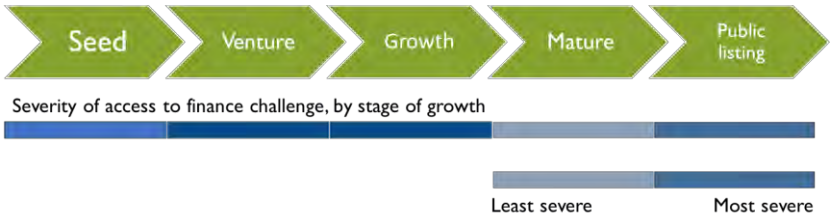


Figure 20: Access to finance challenges across growth stages

Source: The GIIN – The Landscape of Impact Investing in South Asia

Key challenges in early stages include limited capital sources and investor ticket sizes typically too large for small, young companies, limited match of values and expectations between entrepreneurs and investors, bank loans often need an operating track record, collateral and a lack of investment-related knowledge and experience among founders.[22] Matured companies have received most of the known capital, as these companies can absorb larger amounts and meet the requirements of the investors.[23] Venture and growth-stage funding represents the largest gaps. For capital in the range of $50,000 to $1 million, accessing capital is a significant challenge. High net worth individuals are likely a large source of start-up capital, most of which is provided informally, though an angel network backed by the Dutch Global Good Fund and Aavishkaar is looking to change that by creating a formal platform to aggregate such seed investments among angel investors.

3.4.4 Government and donor activities

The Government is taking measured steps to address the perception that Bangladesh is a difficult market in which to operate through the help of information technology. In 2010, the Government adopted the Digital Bangladesh Vision 2021 Strategy, which has led to, among other things:

- The introduction of e-government procurement
- The rollout of e-payment and mobile banking services
- The establishment of the Bangladesh Hi-Tech Park Authority
- The rollout of 3G services and establishment of 5,275 Union Digital Centers through a franchised model in rural areas, to ensure wider access to digital services for government.[24]

In addition, the government through the ICT Ministry is moving into direct financial support of start-ups through the Startup Bangladesh accelerator which provides seed grants to product-focused startups and the IDEA Fund to provide venture capital to select high-growth start-ups such as Sheba.xyz (a service portal to find and hire micro-entrepreneurs), HungryNaki (a food delivery app) and Augmedix (remote medical scribes monitoring doctor-patient interactions via Google Glass). At the Ministry of Posts and Telecommunications, the Leveraging ICT for Growth, Employment, and Governance (LICT) project aims to train a pool of more than 34,000 IT professionals through partnerships with the private sector.

There is also a lack of public-funded research and development that occurs at the university level, which provides the first level of incubation for novel technologies in different fields. Patents and copyrights also take years to obtain and are

[22] Roots of Impact KII

[23] Ibid.

[24] https://www.banglalink.net/sites/default/files/static/files/Digital_Entrepreneurial_Ecosystem_in_Bangladesh.pdf

hard to enforce for small start-ups.[25] As a result, most start-ups are not encouraged to move to protect their intellectual property, which would help in valuation discussions with investors. Another challenge is visas for foreign entrepreneurs, investors and technology professionals who can bring much-needed domain expertise to help build start-up companies here over a longer period than a few weeks at a time. Work permits are difficult and expensive to obtain, and few startups have the resources to pursue them.[26]

A selected few donors are moving away from the traditional NGO-led development model to directly engaging and supporting start-ups. They include DFID, who's Business for the Poor - Bangladesh (BFPB) Challenge Fund provides matching grants to startups developing projects related to financial inclusion for SMEs and micro-entrepreneurs. Several major start-ups such as Sheba and Chaldal have received funding from BFP-B, often in partnership with major financial institutions. The Swiss Development Cooperation (SDC) is actively exploring the idea of a matching facility for start-up investments, which would provide non-refundable, results-based matching grants to early-stage start-ups that can demonstrate impact and have gotten commitments from commercial investors. In effect, start-ups become service providers who are compensated for the impact they generated. Embassies such as the German and Netherlands embassies have provided support to incubators and accelerators.

3.4.5 SWOT (weakness)

According to At Kearney, key challenges for developing the digital ecosystem include:

- Limited availability of talented software developers - There are only about 45,000 software developers in Bangladesh, meaning only three out of every 10,000 people are skilled in IT - a ratio that is 80 percent fewer than neighboring country, India.[27] This naturally results in competition between businesses for mature and high-quality IT specialists, who also have the ability to simply freelance on online platforms rather than work for lower wages in local companies. Some may migrate out of Bangladesh altogether if opportunities are available.
- An immature digital market, as internet penetration may be high but usage is still low due to the relatively high cost of data and lack of internet literacy among users. In fact, most internet usage is still confined to sites like Facebook.
- Very limited seed capital - as mentioned earlier.
- A lack of business and global market knowledge - Universities do not provide high-quality IT education and suffer from a lack of qualified professors and teachers. Accelerators and incubator personnel also lack this knowledge at times.
- Key gaps in the regulatory framework, including ease of foreign transactions, taxes, and registration.

3.4.6 Opportunities

Based on lessons from the Asia region, few strategies have been identified to catalyze the market:

Table 7: Possible future intervention strategy for the digital start-up ecosystem

Strategy	Description	Examples
Government-Sponsored Innovation Hubs	Government-sponsored collaboration spaces and business accelerators centered on particular themes or regions/areas	India, Singapore (Block 71), Thailand (True Digital Park)
Challenge Funds	Open calls for companies with business models that achieve results related to key development challenges/goals, with grant funding complementing the companies' own investment	DFID, BMGF, Netherlands, USAID DIV, Singapore (TIS/ESVF)

[25] KII with Bangladesh IP Forum

[26] Ibid.

[27] https://www.banglalink.net/sites/default/files/static/files/Digital_Entrepreneurial_Ecosystem_in_Bangladesh.pdf

Strong Research Institutions	Government-owned universities invest in developing research capacity, collaborations with universities in other markets	Singapore, Thailand
Government Certification	Fast-track IPR filing, tax exemption, easy wind-up, other legal and financial benefits	India (Startup India)
Foreign Talent	Fast-track work permits for foreign tech talent/entrepreneurs	Thailand (Smart Visa)

3.4.7 Potential strategies and solutions

3.4.7.1 Innovation hubs at leading public and private universities in Bangladesh

USAID has funded many start-up researches and commercialized programs at leading American universities that pertain to its areas of focus. For example, Kansas State University hosts more than four Feed the Future Innovation Labs, thanks to a $100M investment from USAID.[28] Our recommendation is to connect Bangladeshi universities with a strong research track record as well as those with strong business and entrepreneurship programs with "sister" universities in America within the USAID network. These American universities can provide their Bangladeshi counterparts with technical assistance and can jointly collaborate on research and commercialization of new technologies and business models for poverty alleviation. USAID can approach this through a "matching" mechanism where a group of Bangladeshi universities and American universities are put together through a series of in-person, sessions where they exchange ideas and brainstorm on relevant development challenges in Bangladesh, with follow-up trips to Bangladesh by American universities sponsored by USAID and grants for joint projects. Some universities that come to mind include Bangladesh Agricultural University, Bangladesh University of Engineering and Technology (which is very strong in water management, computer science, electrical engineering, among other areas), Independent University Bangladesh, University of Dhaka, BRAC University, University of Liberal Arts Bangladesh - the latter three have their own entrepreneurship labs/accelerators. These innovations can be spun-off or adopted by the private sector through a public-private partnership approach with leading conglomerates and business houses in Bangladesh. At the very least, it will help create a generation of technically-savvy innovators who will go onto decision-making roles at key Bangladeshi institutions or become entrepreneurs themselves.

3.4.7.2 Matching programs between American and Bangladeshi IT companies

The DANIDA Business Partnership (DBP), supported by DANIDA, supports partnership projects between entrepreneurs in Denmark and those in up to 19 developing countries in Asia and Africa, including Bangladesh, with 75 percent funding in the preparation phase and up to 50 percent in the implementation phase.[29] In addition, the team at DBP actively consults with and advises partners on market entry, stakeholder coordination, capacity development, and other pertinent areas. One of the participants in the USAID workshop is a direct beneficiary, thanks to a tie-up with his firm and a company called, Graphic People. Bangladesh was the first country that Graphic People set up an offshoring center, and since then they have established hubs in five other countries, allowing them to scale their capabilities and serve an exponential number of customers. USAID should look for similar opportunities to match American companies, particularly those in high-tech, with Bangladeshi counterparts, whether it is for local distribution, production and/or outsourcing certain capabilities where Bangladesh has a clear and compelling edge when it comes to costs.

3.4.7.3 Challenge grants for specific USAID thematic areas, including humanitarian support

USAID is already facilitating challenge funds through partners like World Fish, which is providing matching grants to start-ups and private sector partners that are complementing the market access component. USAID should seek to find more opportunities to engage innovative Bangladeshi businesses that can serve as critical value chain partners in its market development efforts, including potentially the Rohingya refugee camps in key areas like sanitation, food provision, and education. Many start-ups and private sector actors can complement or play the role currently occupied by Community-Based Organizations and smaller implementation focused NGOs.

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[28] https://borgenproject.org/usaid-start-initiatives/

[29] https://smedenmark.dk/consultancy/business-development/business-partnerships

One example is *Light of Hope*, a social enterprise that is working to beam the Bangladeshi Sesame Street (Sisimpur) all around the country through its solar-powered schools. Its work with Sisimpur recently earned them a contract to set up and run solar-powered schools in the Rohingya camps through Save the Children. This contract is helping the three-years-old start-up to significantly boost operations in the Cox's Bazar area while building up the capacity of the team. The proceeds from the contracts with Sisimpur and Save the Children are being used to develop B2C products for the Bangladeshi consumer market.

As one can see, start-ups can reinvest funds from such contracts into new products and business lines for the domestic market. This would simultaneously help reduce the black-market economy that has grown around the camps while ensuring sustainability for the surrounding communities through formal employment and create a positive legacy by providing the Bangladeshi private sector with an important B2B revenue stream that can help sustain them in the long run.

3.4.7.4 Technical assistance to the Bangladeshi government on start-up related issues

The US has extensive experience with relevant regulations around IP, venture capital (including the JOBS Act, which helped to open up companies to crowdfunding, among other innovations), taxation and managing an inflow of foreign technology talent (H1B program). If the ecosystem is to grow in Bangladesh, relevant organizations like Bangladesh Investment Development Authority, Department of Trademarks and Securities and Exchange Commission need to significantly boost their capacity to deal with and facilitate start-ups and technology-enabled countries.

Healthcare

Domestic Market Size	Export	Employment	2023 Market Size
USD 5.92 B	N/A	0.25 M	USD 11.71 B

3.5 Healthcare

Since independence in 1971, the first two decades of the healthcare service sector was solely dependent on public intervention and foreign aid (support and investment, mostly supply-side financing). At that time, with inadequate infrastructure and resources; the core objective of healthcare functions was to provide primary healthcare support to the mass population, who were heavily affected by the war. In the backdrop of economic reformation[30] during the 90s, the door for private investment/intervention has opened for the healthcare sector. In the following decades, the nation has achieved significant improvement across key healthcare indicators such as U5 child mortality rate, average life expectancy, immunization coverage, maternal mortality rate, and tuberculosis control. However, the sector stands at a crossroads due to issues like lack of healthcare professionals, rising Non-Communicable Diseases, sluggish technology adoption.

3.5.1 Market size and trend: a market worth $9 billion by 2023

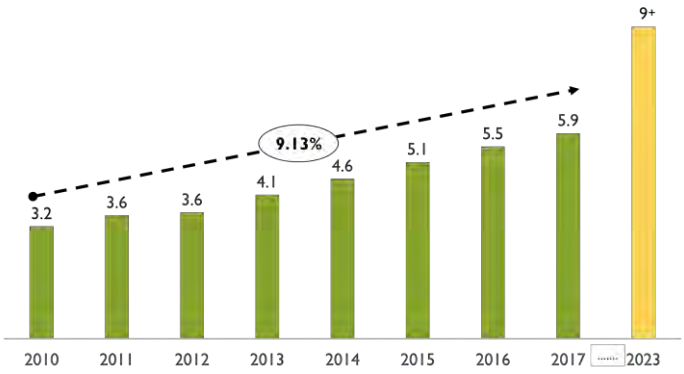

Figure 16: Market trend of healthcare sector of Bangladesh

According to the World Health Organization (WHO), in 2010, the healthcare market size was $3.2 billion[31]. After that, the market has enjoyed a CAGR of around 9.13 percent for seven years and reached $5.9 billion in 2017. Considering the similar growth trend, it is expected that the healthcare market will go beyond $9 billion (excluding the pharmaceutical sector and medical tourism[32]) by 2023. As per TIB's National Household Survey 2015, 63.3 percent of the patient households have sought services from private healthcare facilities beside public hospitals. Although patients are having to spend six times more, private facilities are emerging as the preferred point of service - driven by the 'perceived brand' image and assumed 'service standards' of general mass; catalyzed by aggressive marketing efforts.

3.5.2 Private sector is dominating in Bangladesh

After the 90s, private entities entered the healthcare sector and have contributed a significant role in the industry. The market player embraced a large domain of the sector which includes medical care providers, physicians, specialized hospitals and clinics, nursing homes, hospitals, diagnostic centers, pathology laboratories, wellness centers and training institutes for caregivers.

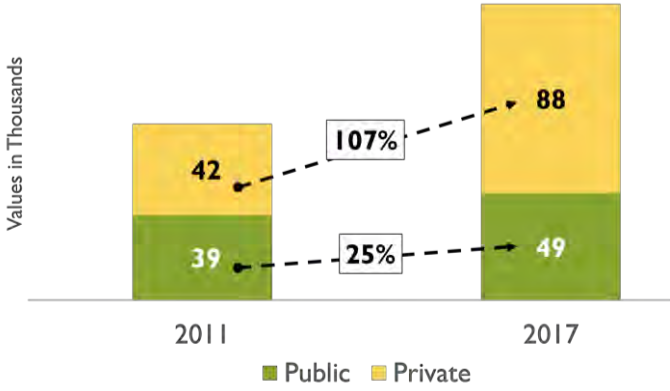

Figure 17: Number of beds available in public and private hospitals.

As per the National Health Bulletin 2017, government hospital beds increased only 25 percent in the last six years where private hospitals achieved 4X higher rate in the same timeline. The graph above clearly identifies that the number of beds in government hospitals increased from 39 to 49 thousand in six years whereas private hospitals beds have increased from 42,000 to 88,000 in the same period. The growth hike provides clear evidence that private sector players are spreading their operation at a much faster pace over the last couple of years. However, Bangladesh has only 8.56 beds per 10,000 populations where the global average is 27 (World Bank, 2019).

3.5.3 Growing manpower: Impact of private investment in creating healthcare professionals

In Bangladesh, from the early decades, the shortage of healthcare professionals is an acute problem in the sector. Bangladesh has a density of physician, nurse, and midwife of 7.4 per 10,000 populations (WHO benchmark to achieve SDGs is 44.5 per 10,000 population). The scenario is more alarming while considering the available number of nurses;

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[30] After 80s economic crises, a series of macro-economic stabilization measures were introduced which restored economic stability in the nation's economy.

[31] To calculate market size, the assessment team has converted per capita health expenditure into national healthcare expenditure.

[32] Every year, 7,00,000 Bangladeshi seek medical care from abroad.

Bangladesh has one nurse against every two registered physicians. As per WHO recommendation for each registered physician there should be three trained nurses.

Table 8: Data plater for medically trained professionals

	Bangladesh	WHO Recommended
Ratio of registered physician compared to population	1: 1,871	1:1,000
The ratio of physician compared to nurse	1:0.4	1:3

Currently, 85,533 doctors are registered in Bangladesh which is approximately 3X higher compared to 2007 but the quality of the education system especially in private medical colleges remained questionable. The number of nurses also increased around 2.5 times in the same time period yet the total number is significantly lower than the national requirement. The graph beside represents the gap between the current figure and WHO recommended number of doctors and nurses. WHO estimated, Bangladesh needs additional 60,000 doctors and 280,000 nurses to maintain a standard level of facilities.

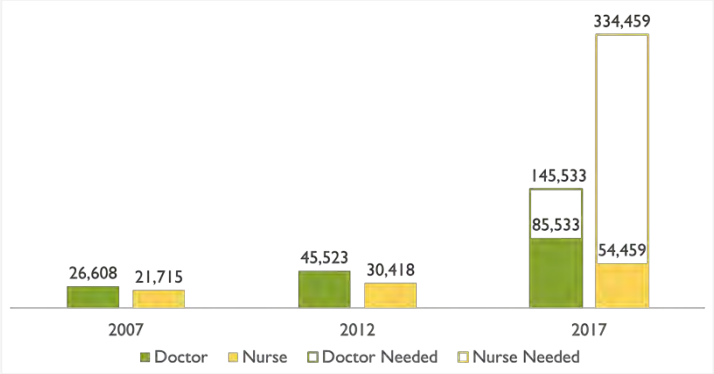


Figure 18: Number of doctor and nurse over time.

Unsatisfactory quality of education in private medical college: A recent report by a local newspaper, Prothom also claimed in an article that, private medical college students get comparatively much-limited scope of practical classes due to a negligible number of patients. Moreover, they are running without enough teachers, let alone experienced teachers and necessary infrastructure. As suggested by Bangladesh Medical and Dental Council (BMDC), a medical college which enrolls 50 students per session should have appointed at least 177 teachers. However, the ratio is not maintained in most cases. As a result, in the last 10 years only half the students who were admitted to private medical colleges passed in the final exam (The Daily Star, 2019)

3.5.4 City-centric healthcare system: 4 large cities together hold eighty-five percent of market share

The historical trend indicates that Dhaka has always preserved the biggest slice of Bangladeshi healthcare expenditure. Bangladesh National Health Accounts (2017) estimated that the capital holds forty-six percent of the total health expenditure where second largest city Chattogram holds sixteen percent; Rajshahi and Khulna jointly hold twenty-three percent of health expenditure.

Dhaka's share is growing upward driven by the increasing availability of services as an outcome of private sector investment in this region. Another reason behind this 'megacity concentrated market' is the rising purchasing power of the residents.

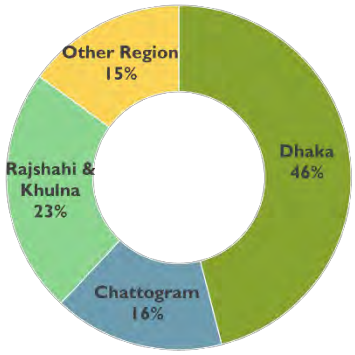
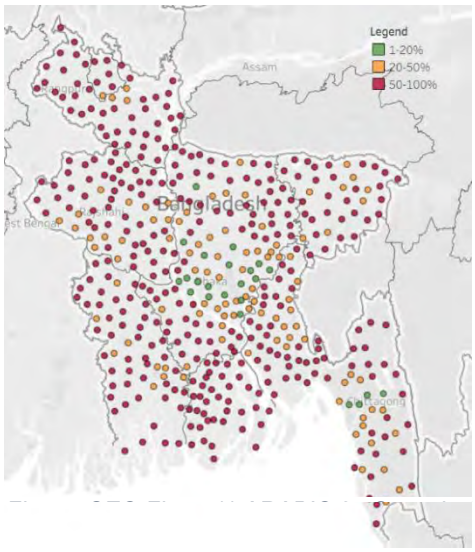


Figure 19: Geo-graphical market share of healthcare market.



The impact of such financial churn can be visible in the number of available doctors per region. The map[33] beside represents upazila wise vacancy of doctors where red dots illustrate the maximum level of vacancy (50-100 percent), yellow dots illustrate moderate level (20 to 100 percent) and green dots (one to 20 percent) illustrate minimum level vacancy. An overview level of investigation from the map shows that the vacancy rate is lower in Dhaka and Chattogram compared to other parts of the country. Upazila situated is countryside or non-urban cluster has more vacancy.

Recently the early stage of decentralization in the healthcare sector is taking place. Apollo Hospital, one of the nation's pioneer hospitals is opening a branch in the port city, Chattogram (The Daily Star, 2016). AFC Health Fortis Heart Institute which is an international cardiac chain of hospitals has opened up branches in Khulna (52 beds), Chattogram (63 beds) and Cumilla (*150 beds*) (The Daily Star, 2018).

However, beyond capital and tier-one cities, to spread healthcare facilities in every corner of the country especially in rural areas, the investment will take place in telemedicine and relevant digital innovation section also.

3.5.5 Rise of tech/innovation start-ups in the healthcare sector

The number of Tech/Innovation based startup has gone up in recent years. More than 10 startups are currently operating in the Bangladesh healthcare sector. These startups are providing services ranging from online doctor's directory and appointment system to developing healthcare-related content for general awareness creation and even mental health. *Praava Health* has introduced the country's first molecular cancer diagnostics lab and fully integrated Hospital Information System (HIS) with Electronic Health Records (EHR) including six labs to collect information of patients which will maintain international standards (Dhaka Tribune, 2019). After launching in 2015, *Maya* a mobile-app based health tips provider has delivered 500,000 consultation services including mental healthcare support (The Daily Star, 2018).

Directorate General of Health Services (DGHS) has launched open meta-data models which aggregate routine health data from government healthcare facilities. However, data from private sector players are still not available for use and sometimes hard to get. If private sector data is integrated into such models, then the system will be more efficient and useful for the healthcare sector.

The current startups which are available in the country have listed below:

Telemedicine- develops telemedicine platforms that allow remote healthcare service delivery and communication with a physician. Ex: Jeeon.

Appointment Scheduling- Allows to schedule appointments with listed physicians from e-platform. Ex: Doctoral.

Preventative Healthcare System- Cloud-based health data tracking system. Ex: CMED.

Pharmacy Delivery- Online medicine shop including delivery facility. Ex: Bhalo Thakun.

Mental and Women Health- On-demand information services on mental and female health. Ex: Maya Apa.

[33] The map has been retrieved from live database of DGHS. To visit, follow the link: http://103.247.238.81/webportal/pages/hw_hrm_upz_physician_distribution.php?fbclid=IwAR3M0yWInL1lhvp9Xuyzr74eba4E7-B8KOj80qLNnVJgSZEx7LlitLx6V3k

Mother and Baby Health- Develop awareness through content and report sharing. Ex: Aponjon by Dnet.

Comprehensive Health Service- Monthly subscription fee-based comprehensive healthcare providers who deliver a set of facilities. Ex: Telenor Health's Tonic, Praava Health.

3.5.6 The pattern of diseases: shifting from communicable diseases to non-communicable diseases

Non-communicable diseases (NCD) are currently changing the tectonic plates of the global healthcare market and Bangladesh is also following a similar trend. Comparing 2012 to 2016, the share of total death caused by NCD has grown from 59 to 67 percent. On the other hand, the proportion of deaths caused by Communicable diseases (dropped from 32 to 26 percent) has declined significantly (World Health Organization, 2017).

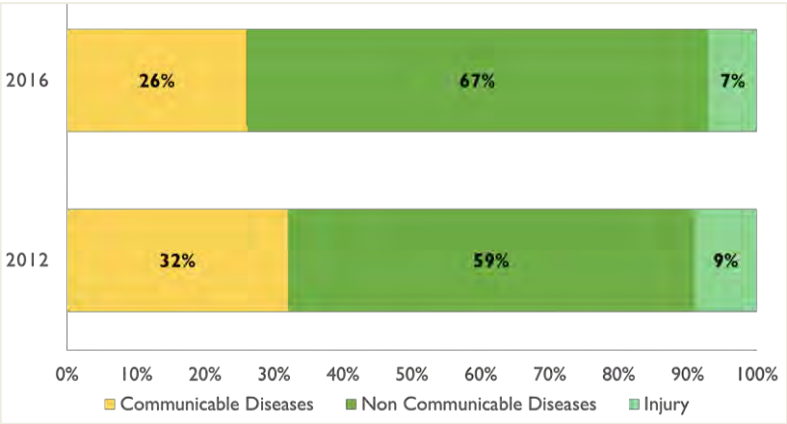


Figure 20: Composition of total death by major diseases

In 2016, cardiovascular diseases were accountable for 30 percent of total death caused by NCD. Other NCD diseases like cancer (12 percent), chronic respiratory diseases (10 percent) and diabetes (three percent) hold the next positions respectively (World Health Organization, 2017). According to the data retrieved from government sources, currently, there are 7.1 million adult populations (aged 29 to 65 and above) who have diabetes (Future Start-Up, 2016) and additional four million adults who have undiagnosed diabetes (Daily Star, 2018). On the other side, three out of four Bangladeshi adults (aged above 35) are in the threats of developing cardiac diseases (New Age BD, 2018). Such numbers indicate that in the upcoming years, NCD will continue to dominate national healthcare sector.

However, changes in disease patterns have shifted cost pattern; nowadays patients are spending more for chronic diseases compared to acute diseases. In response to such changes, the private sector is investing in the development of specialized hospitals for NCD. For example, AFC Health Fortis Heart Institute in collaboration with Fortis Escorts Heart Institute of India has launched Bangladesh's first international cardiac chain of hospitals. At present they have three full cardiac hospitals in Khulna (52 beds), Chattogram (63 beds), Cumilla (150 beds) and one outreach center in Jashore.

3.5.7 Financial pulse: insurance will take over out of the pocket expenditure

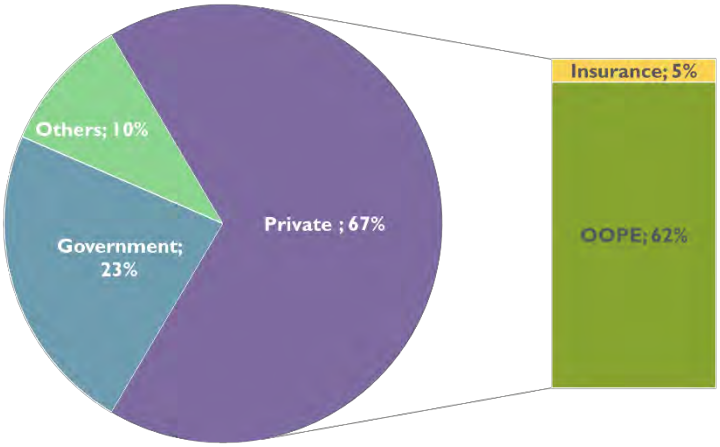


Figure 21: Percentage breakdown of national healthcare financing

In national healthcare expenditure, private expenditure makes up the largest share of around 67 percent while government financing accounts for 23 percent (Bangladesh National Health Accounts, 2015). Exploring further into the private expenditure, two major segments were found, where the insurance holds five percent and Out-of-Pocket-Expenditure[34] (OOPE) holds 62 percent. Health services in Bangladesh remained predominantly financed by households' OOPE. Average OOPE stands at 18.15 percent (global) and 44.24 percent (lower-income countries) both of which are far lower compared to Bangladesh's OOPE (World Bank, 2019). With an aim to achieve universal health coverage, the government has developed the *National Healthcare Financing Strategy (HCFS) 2012-2032*. The strategy also aims to reduce out of pocket payments (OOP) to 32 percent by 2032 (GoB, 2012). In the global context, one of the key strategies to reduce OOPE is insurance.

[34] OOPEs are mostly direct payments by patients made at private, NGO facilities and also to informal providers.

3.5.8 Healthcare insurance market in Bangladesh

In South Asia, Bangladesh has been considered as one of the countries which have the lowest rates of insurance penetration (The Daily Star, 2019) where the insurance penetration rate is 0.5 percent (Asia Insurance Review, 2017). Naturally, lack of this safety net puts a large section of people in jeopardy when they suffer from some illness or face accidents. Due to the absence of reliable best practices, the market is still at a nascent phase in Bangladesh. Currently, some B2C (Business to Consumer) initiatives have been taken to introduce health insurance in Bangladesh like GP Tonic, Robi Myhealth, Doctorol. Universities like Dhaka University, East-West University are covering their students through group health and life insurance.

In South Asian insurance market context, traditional insurance providers have started to adopt innovation to capture the new market. Following the trend, there are some changes in the Bangladeshi healthcare insurance market. One of the leading market players in insurance category, *Pragati*, in partnership with a local startup – has launched specialized insurance service for ride-sharing services (Dhaka Tribune, 2019). Another digital startup *Doctorola* has partnered *Pragati* to launch a cancer care benefit with life insurance. With such rise of tech startup driven disruptions in the health insurance landscape, the possibilities of developing data-driven insurance market are higher in Bangladesh.

3.5.9 Medical tourism: losing market worth $3 billion per year

Medical tourism has become popular among Bangladeshis. It is estimated that Bangladeshi patients spend about $3 billion to seek medical services from abroad, mostly from the neighboring country India and from a few other regional peers such as Malaysia, Thailand, and Singapore. Sector experts believe that approximately 2,50,000 Bangladeshi citizens have visited abroad last year for treatment purpose (with medical visa) among whom more than 55 percent have visited India, 25 percent have visited Thailand and around five percent have visited Malaysia. However, they believe that the real number would be to the north of 7,00,000 as many Bangladeshis often seek healthcare services abroad with a tourist visa (Dhaka Tribune, 2017). As Bangladesh has become a good spot to source medical tourism, in present times, few hospitals from India, Malaysia, and Thailand have started to provide local support (through office or agent) in Bangladesh to guide their customers.

However, realizing the opportunity of capturing such a huge healthcare expense which is being siphoned out to Indian hospitals; private entities in Bangladesh are coming up with new value propositions i.e. partnership/co-branding with foreign hospitals-particularly the popular ones from India. For example, *Imperial Hospital* in Chattogram has come up with a technical collaboration with *Narayana Hospital (India)*, *AFC Health Fortis Heart Institute* has tied up a partnership with renowned Indian healthcare body *Fortis Healthcare*.

3.5.10 Environmental sustainability: Medical Waste Management (MWM)

Under the standard global definition, medical wastes contain both general wastes (approximately 75-80 percent) and infectious wastes (about 20-25 percent). These wastes pose particular health risks to the staff of healthcare facilities, to the patients and visitors, to workers collecting, transporting and treating the waste and to the society and environment in general. In this regard, the DGHS has developed an online record-keeping, reporting, and monitoring system for in-house waste management, conducted training on MWM at various levels, explored the feasibility of different outhouse waste management options in several hospitals in the country. DGHS has also developed new IEC (Information, Education, and Communication) materials promoting awareness campaign on MWM. From 2005, Prism Bangladesh (an NGO) is working in Dhaka on MWM. They collect medical waste from 20 public hospitals and 750 private clinics, hospitals, diagnosis centers every single day.

According to sector insiders, current initiatives are mostly capital city center oriented and do not have the capacity to handle the major portion of the waste generated. There have been examples of government and NGO driven initiatives but the private sector is yet to enter this segment and address the capacity gap.

3.5.11 Mental healthcare: social stigma and limited resources weakening the space

Mental health space has faced multidimensional challenges and has been considered as a blind spot of the Bangladeshi healthcare delivery system. WHO estimated that around 16.1 percent of adults and 18.4 percent of children in Bangladesh are suffering from mental disorders (Dhaka Tribune, 2017). However, mental health professionals believe that the actual number of persons having a mental disorder is beyond the estimated number as Bangladeshi people have a tendency to hide mental disorder due to social stigma. On the contrary, less than 0.5 percent of the total national healthcare budget is allocated for mental health (Daily Sun, 2018). As per Health Bulletin 2017, under direct government

facilities, there are only 928 functional beds available to serve mental patients. On the other hand, the number of trained professional/caregivers in mental health sub-sector is outrageously low where .07 psychiatrists are available for every 1,00,000 populations. In a nutshell, the mental health ecosystem of Bangladesh has been an output of limited resource, scarce workforce and social stigma. Sector insiders shared their thoughts as to how investment in mental health space is happening in India and Pakistan backed up by corporate CSR fund- a model replicable for Bangladesh as well.

ICT & outsourcing

Domestic Market Size	Export	Employment	2023 Market Size
USD 1.1 B	USD 600 M	0.94 M	USD 12 B

3.6 ICT and outsourcing

The Information and Communications Technology (ICT) and IT-enabled services in Bangladesh have been maintaining a double-digit Compound Annual Growth Rate (CAGR) over the last ten years. Also, the domestic market share of local IT/ITES firms is growing rapidly, which is reducing the country's import dependency. Despite being much smaller than global offshore leaders like Philippines and India, the IT/ITES sector in Bangladesh has been demonstrating one of the highest growth rates indicating huge domestic and export potential.

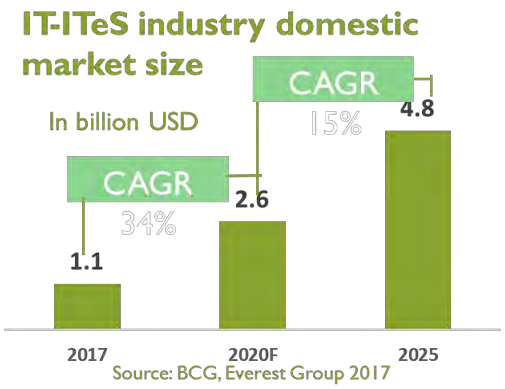


Figure 22: ICT/ ITeS Industry Growth Scenario.

The domestic industry generated revenue of $0.9-1.1 billion in 2017 and expected to grow nearly five-fold to reach $4.6-4.8 billion by 2025. This is remarkably higher than the overall growth forecast for either an established peer location such as India (10-13 percent CAGR for 2017-2020) or an emerging peer location such as Vietnam (12-15 percent CAGR for 2017-2020). According to BASIS the apex trade body of software and IT service firms, customized software brings 60 percent of the revenue and IT services bring the rest for the firms.

3.6.1 Structure of the sector

The IT-ITES industry is majorly focused on IT products and services, with a relatively lower emphasis on ITES / Outsourcing services. Players primarily support traditional IT services such as application development and maintenance, IT helpdesk, and web development; however, there is an increasing number of offerings for next-generation digital services such as big data analytics, Internet of Things (IoT), 3D imaging, and Robotics Process Automation (RPA). In a nutshell, Bangladeshi IT and ITES sector can be categorized into two key segments:

i. **IT (software development)**- mainly driven by companies specializing in software and IT service application development. Customized software development is the main revenue driver of domestic IT sector as 56 percent of the earnings come from this vertical. Firms are also capitalizing other market opportunities by specialized web service i.e. Cloud service, System integration support and IT consulting. The mobile app market is another rapid growing domestic market for firms which have higher potential ahead in the domestic market. Other than that, firms are also focusing on web-based service, and content that includes specialized portals, listing services, payment intermediary services and development of web applications based on cloud/Software as a Service (SaaS) delivery models.

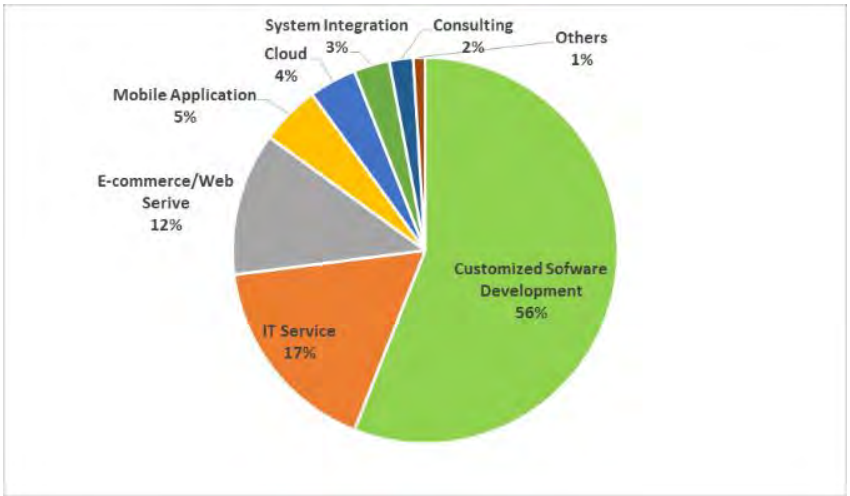


Figure 29: Service group specialization of IT and ITES firms

Technology-based service aggregators (including e-commerce, ride-sharing and mobile wallet) are also expanding rapidly with a strong focus on the domestic consumer market.

Banks are the top buys of locally produced customized software, web applications based on cloud, and Software as a service (SaaS) as twenty-seven out and sixty local banks are using locally made products. BASIS's member firms have seen 100 percent annual growth in a number of local clients in FY 2016-17.

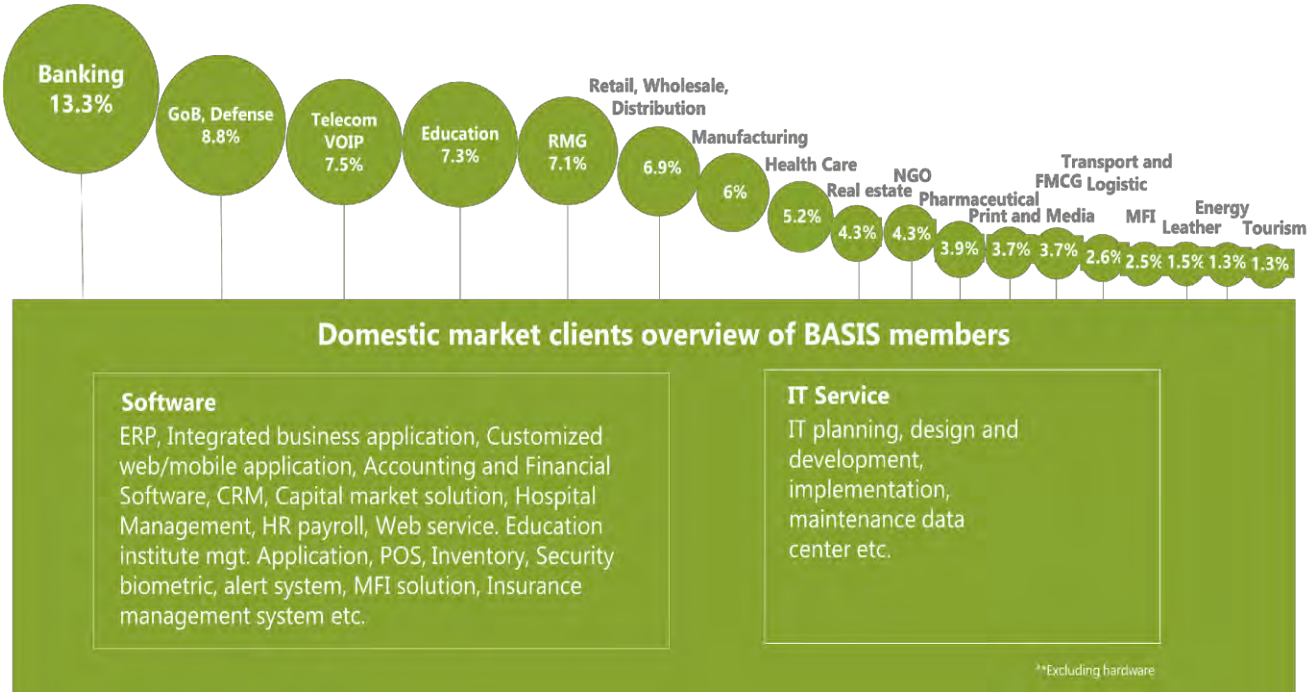


Figure 30: Domain function and industry specialization overview of BASIS members

ii. **ITES-** driven by a mix of enterprises as illustrated below:

Call centers serving local clients such as telecom, banking and ride-hailing. According to BACCO- the apex trade body of call center firms, a total of more than 120 call centers are operating in Bangladesh earning approximately $300 million in FY 2016-17 90 percent of the revenue was general serving local customers.

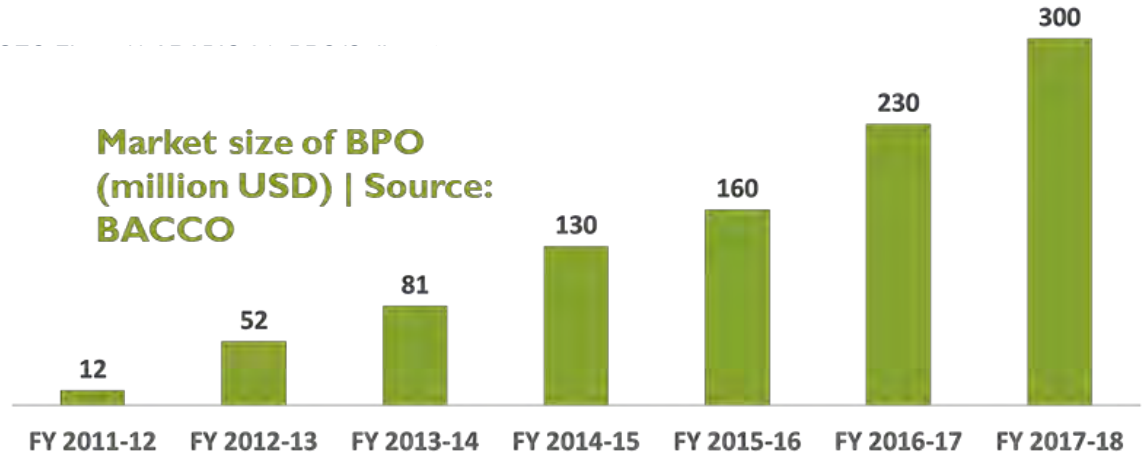


Figure 23: BPO/Call center industry market size

Freelancers: According to the Oxford Internet Institute, there are more than 650,000 online freelancers and 2,500 agencies who are serving in different freelancing platforms.

In addition to the above, there are a number of firms who have emerged as ecosystem enablers in the IT and ITES market. **Internet Service Providers (ISP)** are the biggest ecosystem enablers as they are serving many IT and ITES firms, governments and consumers.

3.6.2 Export scenario

According to BASIS (industry association), Bangladesh IT and ITES market crossed the export earnings of $600 million in FY 2017-18 and touched $1 billion (FY 2018-19-Q1) with a CAGR of 39.54 percent. It is expected to grow five-fold to reach $4.6-4.8 billion by 2025. Bangladeshi IT and ITES firms export to over 60 countries among which US buyers are ranked at the top generating close to 35 percent export revenue. UK buyers contribute around 15 percent, followed by a number of EU countries such as Denmark and the Netherland. A number of local enterprises also export IT-ITES service to UAE, Saudi Arab, South Africa, Malaysia and Singapore where sizable number of Bangladeshi expatriate businessmen are playing an important role in creating demand through country branding. Within ITES services, non-voice services (such as graphic designing, industry-specific BPOs for telecom and financial services, and risk and compliance BPOs) are more prominent services delivered by Bangladeshi exporters as compared to voice-based services which are only provided for domestic market.

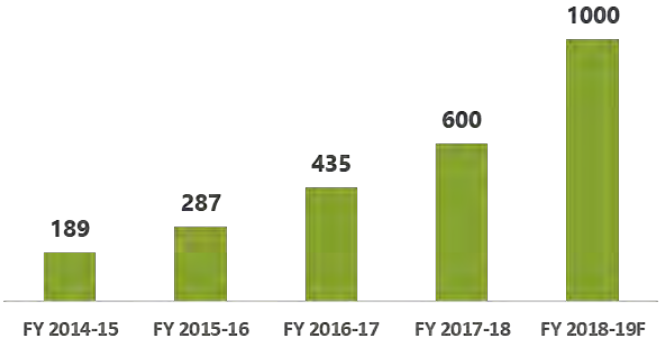


Figure 24: IT/ITES export market revenue

3.6.3 Support functions for the industry

3.6.3.1 Fiscal and policy support

The current government of Bangladesh has a strong commitment to building 'Digital Bangladesh' and leveraging IT-ITES for achieving Sustainable Development Goals (SDGs). ICT division has formulated a roadmap in 2016 focused on creating employment in the IT and ITES sector for moving towards a developed economy. In chapter 12 of *seventh five-year plan* some of the strategies were mentioned, such as improving ICT infrastructure, enhancing online transaction and payment infrastructure, building ICT connectivity, investing in R&D, and One Bangladesh initiative. Government has also formulated a number of policies to accelerate the sector: National Digital Commerce Policy 2018, Bangladesh Hi-tech Park Authority Act 2010, Digital Security Act 2018, Mobile financial service regulation 2018, Ride-sharing service guideline 2017. In addition, recent announcements of National Export Policy 2018-21 have listed IT and ITES sector in most priority sector and provide incentives which are very progressive and put Bangladesh at par or better with policies and incentives that currently exist in other export peers like India, Philippines, Vietnam, Myanmar, and Sri Lanka. Entrepreneurs will enjoy seven-year tax holiday for registered IT firms and exports will get 10 percent cash incentives. The policies on Hi-tech Park, Software Technology Park (STP) and Private Software Technology Parks (PSTP) are also very encouraging and aimed at driving business growth- providing a very healthy public-private partnership.

3.6.3.2 Infrastructure support

Name of STP	Current update	Expected job creation after full operation
Kaliakoir Hi-Tech Park	Partially operational with 4-5 device manufacturing and IT companies	50,000
Janata Tower Software Technology Park	Fully operational	10,000
Jashore Software Technology (IT) Park	Fully operational but only 13 companies established their offices	15,000
Sylhet Hi-Tech Park	Under construction	10,000

Mohakhali IT Village	Under planning	8,000
Barendra Silicon Valley, Rajshahi	Under construction	10,000

Private STP's are-

I. Augmedix BD Ltd
II. Digicon Technologies Ltd.
III. BJIT Ltd.
IV. Kazi IT Center Ltd.
V. Mars solutions Ltd.
VI. Hello World Communications Ltd
VII. Aplombtech Tech BD Ltd
VIII. Service Engine Ltd
IX. DataSoft Systems Bangladesh Limited
X. Service Solutions Pvt. Ltd
XI. Fair Electronics Limited
XII. Divine IT Limited
XIII. Devo Tech Technology Park Ltd

Establishing "Sheikh Kamal IT Training and Incubation Centre' at the divisional level is under planning. Government is now focusing on building constitute on Cyber Security Agency and world standard Digital Forensic Lab.

3.6.3.3 FDI

According to BASIS data, only 16 percent of the members companies have received total $29.60 million FDI in the year FY 2016-17, however, the figure has seen 57.49 percent higher growth with respect to FY 2015-16. Country wise Malaysia ranks the highest and India is the second and the USA is the third in FDI inflow to Bangladesh IT-ITES sector in FY 2016-17.

3.6.4 Sustainability of the ecosystem

3.6.4.1 Employment and inclusion

According to BASIS, Bangladeshi IT sector directly employed approximately 400,000 people where most of them are white-collar professionals. At the same time, Bangladesh has one of the largest freelancers' communities in the world with more 650,000 online freelance workers. Freelancing is not only a good solution to youth unemployment, but it is also helping youths become self-dependent and ensuring their financial freedom. Freelancing, as a sector, has got the highest inclusion potential given transgender; socially excluded even PwD with proper knowledge and training can work independently and earn revenue.

In terms of gender inclusiveness, *call centers* have the highest potential among all IT/ITES verticals where current female employment rate hovers around 30-40 percent. The rate is substantially lower across all other sub-sectors of IT/ITES industry. Considering all sub-sectors, the aggregate statistics for female employment stands at 15-16 percent (BASIS) which is substantially lower than export peers such as India and the Philippines.

3.6.4.2 Environment

Since the sector is highly service-oriented, therefore it does not produce any direct effect on the environment through producing solid or liquid waste. However, Bangladesh has seen increased import and usage of Computers, Laptops and Mobile devices in the last two decades. According to the Environment and Social Development Organization Dhaka, Bangladesh generates 2.7 million metric ton of E-WASTE per year which placed Bangladesh in one of the highest E-WASTE generating countries in the world. Computer, Mobile phones, CFL bulbs, Television holds the majority of portion in the pie of E-WASTE. Recycling is a sustainable solution as valuable elements can be found in electronics waste such as copper and gold. E-waste dumping and storage sites of Dhaka city are located in *Nimtali*, *Dholaikhal* and *Jinjira* of Dhaka South City Corporation. Few firms are recycling E-WASTE at SME level such as Azizu Recycling and E-Waste Company Ltd, and Junk Enterprise located in *Dholaikhal* but they are not licensed under the Department of Environment (DoE). DoE has drafted a comprehensive legislation on e-waste management titled "Electronic and Electrical Waste

Management Rule". The proposed law is now awaiting the ministry's approval. Large conglomerates such as Telecom operators, Banks, corporates are bound to sell E-WASTE to licensed recycling companies. Bangladesh IT and ITES sector is lagging in the proper management of E-WASTE which is necessary for preventing health and Safety hazard.

3.6.5 Opportunities to capture a strong position in global IT/ITES space

3.6.5.1 Large, young and trainable talent pool

With more than half of the population below the age of 25 years, Bangladesh offers a vast pool of young and trainable talent. Total university enrollment has nearly doubled in the last decade, surpassing 1.6 million in 2016. There were 543,000 tertiary graduates in FY 2016-17 where nearly 16,000 had an IT-related degree and about 130,000 had business degrees. This talent pool is getting amplified through various IT training launched by the government that will propel the IT and ITES sector growth. The average talent costs are significantly lower than of export peers India and the Philippines. According to research by Tholons, entry-level BPM talent is 30-40 percent less expensive than India and 50-60 percent less expensive than the Philippines.

Country	Workforce (in million)	Tertiary Grads	Entry level BPM salary (in $/month)
Bangladesh	77	463,000	110-250
India	481	4,000,000	145-350| 120-200 (T-2)
Philippines	42	570,000	250-500 |200-400 (T-2)

3.6.5.2 Cost competitiveness

The global offshore services industry has long focused on maximization of cost savings and continually increased leverage of locations providing the next-wave of savings. Amongst the top 250 IT-ITeS delivery locations, Bangladesh is the lowest-cost destination offering significant savings over any of its counterparts. According to Everest Group Research, Dhaka is 16-20 percent less expensive than Bangalore, and 30 percent lower than Cebu (Philippines) for BPO and IT service outsourcing. With the completion of multiple high-tech parks and increased office space, office rentals in Bangladesh are expected to further reduce by up to 40 percent in the next two years, adding to the cost competitiveness of the location.

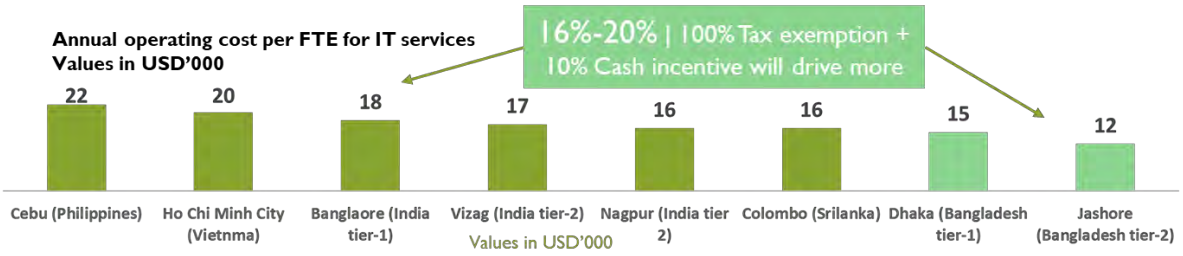


Figure 33: Cost advantage in service delivery against export peers

Bangladesh's value proposition of lowest cost destination is further strengthened with the impact of attractive government incentives, including 100 percent tax exemption (until 2024) and 80 percent VAT exemption on utilities (such as office rent and electricity). In addition, the government has announced up to 10 percent cash back on the total export revenue to attract investment from global companies in the IT-ITES sector. In line with these benefits, tier-2 cities such as Jashore, Rajshahi, and Kaliakoir will also become prominent destinations. These locations have well-developed local economies and can provide access to sizable talent pools while offering 15 to 20 percent less cost than Dhaka.

3.6.5.3 Growing government procurement market: domestic and regional level

Almost all the countries in South Asia are going through a digital transformation phase which requires large scale procurement of IT/ITES services. Bangladeshi enterprises have already been successful in tapping into this regional government procurement market: Tiger IT's $43 million deal for Nepal Government is a recent testament to that fact. Domestic market demand is dominated by the public sector as GoB plans to make aggressive investments in large-scale

technology projects such as smart grid project, digital connectivity project, smart city project, airport digitization project and multiple other projects with a combined value of nearly $6 billion. Several IT-ITeS providers such as Wipro, IBM, TCS, and Augmedix have already set up delivery centers to tap this opportunity.

Leather & leather goods

Domestic Market Size	Export	Employment	2023 Market Size
USD 1.9 B	USD 1 B	0.6 M	USD 4.8 B

3.7 Leather and leather goods

Leather and leather goods industry is the second-largest export earning sector for Bangladesh after RMG (Dhaka Tribune, 2018). Understanding its potential, the government has announced leather, leather goods, and leather footwear as the "Product of the Year" in 2017 and set a target of $5 billion export by 2021 (BD News 24, 2017). On the contrary, the leather sector is facing numerous challenges such as non-functional CETP in Savar Tannery State, export compliance issues, inadequate infrastructure, inefficiency in sourcing raw material, and many more. Hence, the industry requires strong long-term remedial measures along with further integration with the global value chain, and improvement in social and environmental compliance for future growth.

3.7.1 Structure of the sector

The industry comprises of four categories of leather products such as 1. Tannery output 2. Finished leather 3. Leather footwear and footwear components, and 4. Leather goods and accessories (BIDA, 2019). Along with finished leather, footwear and leather goods segments also hold considerable potential in the export market. There are approximately 3,500 SMEs, ninety large firms, and fifteen big enterprises present in the value chain (BMET, 2017). At the same time, the industry possesses strong backward linkage through locally sourced raw materials, with possible potential domestic value addition as high as over 80 percent through trainable cheap labor and location advantage. To support the value chain, development of dice, mold, *last* (the wooden or plastic mold upon which a shoe is constructed) and sole manufacturing factories have also been developed.

3.7.2 Statistics representing the industry

Endowed with 1.3-1.8 percent of the total cattle stock and 3.7 percent goat stock, Bangladesh has a share of only 0.6 percent of world leather trade (ADB, 2018). There are approximately 350 million square feet of raw leather produced annually in Bangladesh, 80 percent of which gets exported out of the country resulting in less gross value addition of raw material through domestic manufacturing. With the total market size of $2.9 billion, the sector is contributing just above one percent of the country's GDP (The Independent Bangladesh, 2018). The industry is expected to reach $4.8 billion at the end of 2023 (Inspira extrapolation, 2019).

The estimated domestic demand for leather and leather goods was $1.9 billion during FY 2017-18 with 13 percent year on year growth. Despite being such a potential sector, 40 percent of total domestic demands are catered by imported goods (The Independent Bangladesh, 2018).

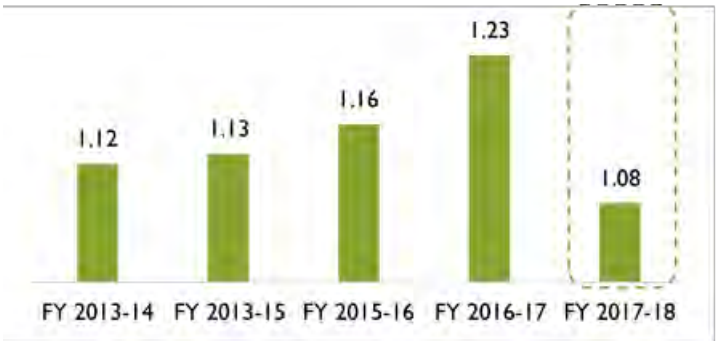


Figure 25: Leather and leather goods export volume, in billion

At the same time, the overall export market size was reported to be $1.08 billion, with a 14 percent annual decline (The Independent Bangladesh, 2018) whereas from FY 2012-13 to FY 2016-2017; the industry showed an annual growth rate of nine percent (ADB, 2018). With a closer look at the breakdown of the last fiscal year's export data, it can be inferred that $183 million worth of processed leather and $338 million worth of leather products were exported with a negative ANNUAL growth of 21 to 27 percent respectively. However, the leather footwear segment had a positive growth of 5.9 percent with export earnings of $565 million, which surpluses $36.67 million than the targeted export earnings (The Independent Bangladesh, 2018).

Exported Leather	FY 2017-18	Growth
Processed leather	$183 mil	- 21 %
Leather products	$338 mil	- 27 %
Leather footwear	$565 mil	+ 5.9 %

A quick look at the declining trend across two major product categories (as outlined in the table above) will reveal the ongoing struggle of this sector with regard to environmental compliance. There are about 220 tanneries in Bangladesh, most of which were in *Hazaribagh*. Inefficient and environmentally hazardous tannery operation in Hazaribagh caused severe pollution of the nearby *Buriganga River*, which lowered the value of the leather processed in Bangladesh. The relocation of tanneries from Hazaribagh to Savar Tannery Estate intended to avoid further pollution of the Buriganga River and eventually raise the value of Bangladesh leather. For this, a Common Effluent Treatment Plant (CETP) was built on the site to facilitate the use of better technologies for clean leather treatment and effluent recycling. However, the CETP is only partially operational and polluting the nearby Dhaleshwari River. With this compliance problem in the value chain, local exporters could not achieve the required traceability standards and eventually experienced a decline in the export earnings. To meet the forecasted export of $5 billion from leather, leather goods, and leather footwear by FY 2021, the annual export growth rate needs to increase to 16 percent from current situation (ADB, 2018).

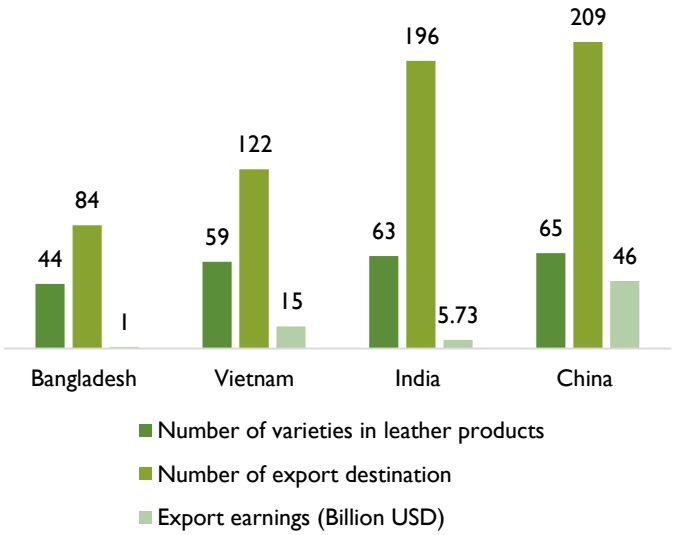


Figure 26: Frontline leather exporters comparison

Even though endowed with locally available raw material and government supports, Bangladesh is outperformed by most of the regional neighbors. Bangladesh's export of leather and leather products is highly concentrated in a few markets whereas the country is exporting forty-four leather products to eighty-four destinations. In comparison, Viet Nam exported fifty-nine leather products to hundred twenty-two destinations; India, sixty items to hundred ninety-six destinations; and China, the global leader in leather exports, sixty-five leather items to two hundred and nine destinations. Comparing with China's current export earning $46 billion, Vietnam's $ 15 billion, and India's $ 5.73 billion, Bangladesh export volume is only $ 1.08 billion (ADB, 2018).

Investment

Of the $2.4 billion FDI net inflow in 2016-17, $24 million inflows were into the leather and leather goods sector (Bangladesh Bank, 2018). In addition, Chinese, Vietnamese and Indian investment in Bangladesh leather sector is also ramping up. Chinese investors had invested in around fifteen new export-oriented footwear factories in the Chattogram Export Processing Zone (CEPZ) throughout FY 2018-19, where they were manufacturing footwear and exporting their products abroad which reflect the long-term growth prospects (The Independent Bangladesh, 2018).

Growing synthetic footwear sub-sector:

Along with leather footwear, Bangladesh is also emerging as a leading supplier of synthetic footwear, providing price competitive good quality product. Synthetic footwear export stood at $108.42 million in FY 2017-18 (June to December) which was $102 million in FY 2016-17 (June to December) (BIDA, 2019). In FY 2014-15 the export of synthetic footwear was 171.57 million (EPB, 2016). The reasons for the fast rise in demand for synthetic footwear include the non-compliance issues surrounding the leather industry. At the same time, the price of synthetic or polysynthetic leather footwear is also three times cheaper than the original leather footwear. An increased number of global retailers are sourcing artificial leather items from Bangladesh due to a rise in production costs in China.

Bangladesh is now supplying sports shoes, sandals, flip-flops and boots to a number of leading global retailers including Nike, CK, H&M, Decathlon, Skechers, Puma and many more. In terms of price, a pair of non-leather shoes cost $3.2, whereas leather one's cost around $9. Similarly, a pair of non-leather boots cost around $10 against $30 for the pure leather ones (Daily Star, 2015).

3.7.3 Available support to boost the industry

3.7.3.1 Fiscal support

- **Cash incentive:** The cash incentive against the export of leather products and footwear has been increased to 15 percent effective from FY 2016. Cash incentive of five percent for export of crust leather from Savar tannery Estate (BIDA, 2019).
- **Tax holiday:** Not Available
- **VAT exemption for import:** Duty-free import of all types of raw materials and machinery for export-oriented leather and leather goods.

3.7.3.2 Non-Fiscal support

- **Presence of sectoral roadmap:** Given the target of forecasted exports revenue of $5 billion from leather, leather goods, and leather footwear by FY2021, there is no roadmap to support the industry.

- **Presence in export policy 2018-19:** Leather footwear and Leather goods have been identified as *highest priority sector* in Export Policy 2018-21. To support the export market, the bonded warehouse factories are enjoying 90 percent loan approval against letters of credit and funds for export promotion along with the export credit guarantee scheme.

- **Presence in BIDA potential sector:** Leather and Leather goods sector is also identified as a potential sector by BIDA. The industry has also been identified as a priority sector in the *7th five-year plan* based on its considerable growth and investment potential.

- **Presence in industry policy 2016:** Leather and Leather goods have been identified as a *highest priority sector* in Industry Policy 2016.

- **Presence in the economic zone:** To support the tanneries, Savar Tannery Estate has already been established. To boost the growth, leather and leather goods sector has been added in the planning of four economic zones named: Abdul Monem Economic Zone (AMEZ), Bay Economic Zone, Arisha Economic Zone, and Mongla Economic Zone.

3.7.4 Sustainability system of the leather industry

3.7.4.1 Employment inclusion

This highly labor-intensive sector directly employs around 200,000 people and around 850,000 people are connected to the sector indirectly (ADB, 2018). Among total employment, there is a presence of approximately 23 percent female in the overall leather industry (combining all subsectors) and most of them migrate from rural areas towards industrial clusters. Thus, access to employment contributes to the reduction of poverty and improvement of livelihood. Certain sub-sectors under *leather* have higher female inclusion potential as evidenced by the fact that footwear export sub-sector employs more than 70 percent of women in the (ADB, 2018). The industry is one of the best performers in terms of absorbing unskilled workforce; unskilled labor comprises of approximately 99.50 percent (SEIP, 2017) of the workforce. Generally, the blue-collar employees start as unskilled trainees and gradually turn into the semi-skilled and skilled workforce through internal training and experience.

There is also a visible presence of foreign employees in the sector particularly in white-collar segment. The export-oriented companies are highly depended on foreign experts for their product design and development along with top management and technical support team.

3.7.4.2 Social compliance

Even after the relocation of the tannery state to Savar, the condition remained unchanged. The working condition of the tanneries is not at all complaint to health and safety requirement by LWG, which results in exposure to hazardous chemical and combustible elements along with usage of high-risk equipment without providing the required training. Leather Working Group (LWG) multi-stakeholder group are to develop and maintain protocols that assess the environmental compliance and performance capabilities of leather manufacturers and to promote sustainable and appropriate environmental business practices within the leather industry. It was also found that the tannery works are not suitable for differently-abled individuals, however, in the footwear sector, there is a scope of inclusion of differently-abled individuals. In addition, proper policy-making for third gender community and changed attitude of both third genders as well as general people would influence the inclusion of the third gender into the workforce.

3.7.4.3 Environmental compliance

The industry falls under the "Red" category in *Environmental Clearance Certificate* referring to highest negative footprint to the environment. To minimize this negative footprint, the relocation of tanneries from Hazaribagh to Savar Tannery Estate was intended to avoid further pollution of the Buriganga River and ensure better work environment and eventually resulting into better compliance to boost the industry as a whole. Inefficient and environmentally unfriendly tannery operation in Hazaribagh caused severe pollution of the nearby Buriganga River, which lowered the value of the leather processed in Bangladesh. A Central Effluent Treatment Plant (CETP) was built to facilitate the use of better technologies for clean leather treatment and effluent recycling. However, the CETP is only partially operational and the wastewater which contains a high level of the chemical is continuing to pollute the nearby river *Dhaleshwari* River.

The major problem of leather sector remains in the CETP of Savar Tannery Estate. The process of constructing the CETP was commissioned by the government to the lowest bidder not considering the quality/required expertise, resulting into an ill-functional CETP. This has contributed towards poor traceability of leather outputs from Bangladesh. The chemical usage in tanneries is also substantially higher than international standards. At the same time, the solid waste from tanneries is still being dumped in a pond near tannery estate which eventually flows into *Dhaleshwari* River. The non-compliant/semi-functional ETP plant forced the export-oriented players to import wet-blue from countries like Australia and India which increases the cost of production by 40 to 50 percent that resulted in a higher price for the finished product. To solve these issues, countries top export-oriented companies demanded private ETP (instead of a *Central* ETP), the procedure of which is under the process of negotiation.

3.7.5 Key challenges

The key challenge of the leather industry still remains in partially functional CTEP which requires pragmatic and proactive interventions to save the industry. Besides, the value chain challenges that the industry faces are as follows:

Inefficient procurement of raw material: Almost 50 percent of the raw material are sourced during the Islamic religious festival, Eid al-Adha, requiring quick measures of collection, facilitating the transferring process and financing in a very short amount of time. A large number of animals are slaughtered by semi-skilled butchers across the country results in considerable damage to hides and skins. This process hampers the overall quality of raw hides and the inefficient procurement system results in weak leather traceability, resulting in a reduced value of leather in the global export market. Such issues have forced the country to compete in the lower price segment rather than competing through quality. The price needs to be competitive to the domestic and international market as well

Lack of product design expertise: Leather product is predominantly used for the fashion industry worldwide. Thus, the quality and design are crucial factors which need careful observance along with integration of innovative and attractive latest fashion trend. At this stage, Bangladesh's design capability, product innovation and quality control measures of leather sector is at nascent level.

Absence of Common Facility Centers (CFC) High-value investments in machinery and equipment are required for tanneries to move up the product value chain - from making crust leather to finished leather. Many small and medium tanneries do not find this financially viable, as their operating capacity is much smaller than the design capacity of new machinery. So, SMEs need to have access to a common facility center. A CFC for processing crust into finished leather needs to be set up and used on a sharing basis by tanneries. In many developing countries, such CFCs have been set up during the early phase of development of the leather sector. In addition to reducing financial burden for individual tanneries, the CFC will also reduce on the job cost of training their workers on the new processes and machinery

Absence of policies promoting high-value addition: Only a small volume of crust leather is converted to finished leather by Bangladeshi tanners. Most of the raw hides and skins processed in the country is exported as a crust leather without any value addition within the country. Encouraging tanners to move up the product value chain will result in significant economic gain for the sector and country. It is worth mentioning that, the finished leather fetches about 60 percent higher price than crust leather.

In addition, the cost of getting the requisite permits and approvals for business remains high along with long procedures and formalities involving trading across borders, which continue to amplify the sector's weaknesses and hinder sector's investments. **Beyond these** significant problems, there are other challenges existing such as lack of access to finance, lack of skilled workforce, inadequate training facility, import dependency for expensive chemicals, the inadequate infrastructure

Light engineering

Domestic Market Size	Export	Employment	2023 Market Size
USD 3.12 B	356 M	0.8 M	12.06 B

3.8 Light engineering

The light engineering sector is often referred to as the 'mother industry' which is significantly integrated into the backward linkage for agriculture, food processing, railway, shipbuilding, RMG, cement, paper, jute, textile, and sugar industries. The sector contributes nearly one percent to the country's GDP but did not attain required growth as expected. Increased domestic demand helped the sector to grow but faced enormous challenges in the export market due to lower product variety and quality. In recent 'industry policy 2016' and 'export policy 2018-21', the sector is considered as one of the highest priority sectors. But key informants repeatedly mentioned that being an SME driven sector, it requires more direct support beyond policy such as access to finance, training to create skilled workforce, ICT inclusion etc.

3.8.1 Structure of the sector: industry led by micro, small and informal ventures

Light engineering is a segment of engineering which is dealt by people who are called 'engineering artisan'- a vast pool of labor force coming from a disadvantageous socioeconomic background with no formal education and chronic poverty. A field visit in small engineering shops in Bogra by the assessment team revealed that technicians in that shop with almost no education are creating and repairing many engineering parts and machinery. Hence, this was one of the concerns in this assessment to address this issue by embedding insights retrieved from key informant interviews.

Being an important sub-sector of manufacturing industry, the light engineering sector is providing critical support by producing a wide range of spare parts, casting, molds and dies, oil and gas pipeline fittings, light machinery, etc. as well as repairing service. In addition, the sector also supplies complete machines as a finished product for a few industries. More than 50,000 micro, 10,000 small and medium enterprises are scattered across the country in different clusters. One effort by SME foundation identified 7500 enterprises as part of 31 light engineering clusters concentrated across 18 districts. Out of all these clusters, there are some major hubs focused on different industries (ICE Business times, 2016).

Table 9: Major hubs of the light engineering sector

Hub	Focus
Rangpur-Dinajpur Sylhet	Spare parts for automobiles, railways, mills, factories
Bogra-Natore	Foundry, agro-machinery, LPC, cylinders,
Dhaka-Gazipur-Narayanganj	Capital machinery, bicycles, construction equipment
Khulna-Barishal	Spare parts for mills and factories
Chattogram	Ship-breaking linked factories

Apart from these micro and small enterprises, large conglomerates such as Walton, RFL and Meghna Group are also manufacturing light engineering products including nuts, bolts, molds, bicycles, etc. For agro machinery, Metal, Alim Industries Ltd. ACI motors etc. are playing a vital role.

The enterprises can be grouped under the following categories:

1. **Foundries**: A wide range of cast metal products are manufactured. There are two types of foundry or cast metal products manufactured in Bangladesh; foundries made from iron are called ferrous type foundries and the usage of different metals like aluminum, brass, lead, etc. are categorized as nonferrous foundries. Some of the foundry products are the metal casing of pumps, liners for engines, oil expellers, paddy threshers, etc.
2. **Machine shops:** Using the foundry products or cast iron as primary materials, machine shop produces finished form of all metal products.
3. **Repair workshops:** This segment completely deals with repairing jobs which are required by different sectors such as agriculture, automotive, etc. Sometimes these jobs require foundry segment's assistance in order to facilitate the process.

3.8.2 Statistics: domestic and export market

The domestic market sized at $3.125 billion in FY 2017-18 with a 30 percent annual growth rate and local enterprises meet about 30 percent of the total domestic demand. (AHMED, 2018). Industry insiders claim that electrical goods such as a switch, socket, and light shed. Which are manufactured by the LES enterprises is now meeting approximately 52 percent of the country's demands. Moreover, engineering equipment from *Globatt (a popular battery brand by local manufacturer Rahimafrooz Ltd) and Duranto* (a popular bicycle brand manufactured by one of the leading conglomerates PRAN-RFL ltd) have achieved global recognition in recent years. The manufacturers are currently capable of producing nearly 3,900 types of machinery, spare parts, and accessories which includes automobile spare parts, railway engine's parts, rail line parts, cycle and rickshaw parts, cylinders, machine tools, jute, and textiles machines spare parts. Most of the raw materials are extracted from ship scrap collected from shipbreaking yards.

Being highly labor-intensive sector, the light engineering sector generates ample employment opportunities in the economy, especially into the areas where there is an abundant supply of skilled and semi-skilled labor. Around eight million people are working for this industry. The workforce is highly dominated by male workforce, and less than 10 percent of women are involved in the enterprise-level work (Inspira extrapolation, 2019). Almost all of the SMEs employ unskilled or semi-skilled labor force.

Export has experienced strong growth until 2017. According to the Export Promotion Bureau (EPB), light engineering products fetched $688 million in 2016-17. However, according to recent data by EPB, export earnings of light engineering products fell drastically in the fiscal year 2017-18, generating only $355.96 million, which is approximately 55 percent short of its targeted earnings of $876 million.

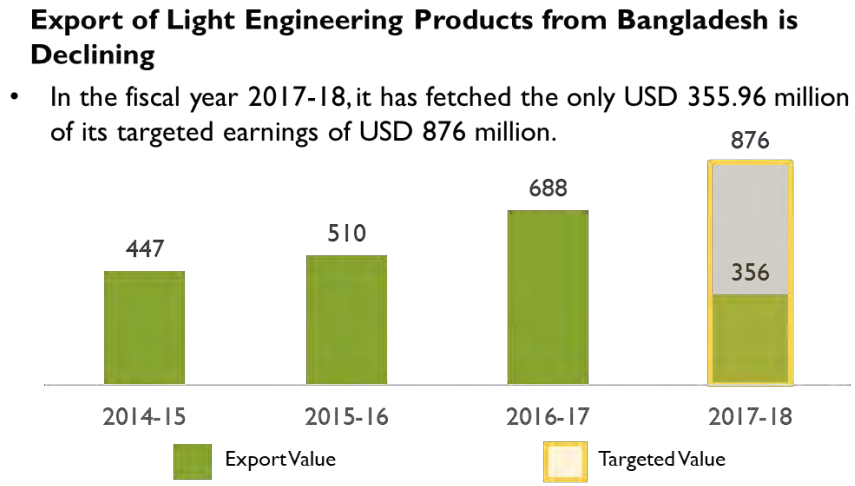


Figure 27: Export of light engineering products from Bangladesh

3.8.3 Support:

3.8.3.1 Fiscal incentives:

- Bicycle export receives a 15 percent cash incentive
- Bicycle manufacturing industry gets a tax holiday

3.8.3.2 Non-fiscal incentives:

In the export policies of 2015–2018 and 2018-2021, the light Engineering industry is considered as one of the most future growth potential sectors. Several visions are mentioned in the policy including a moratorium on income tax, easy terms export credit, and reduced rate of interest. Moreover, the Government has planned to establish 'Light Engineering Cluster Village' near Dhaka in order to develop the industry. In addition, the light engineering sector will get 36 percent of the allocated industrial area of Mirershorai Economic Zone.

3.8.4 Industry dynamics (opportunities)

3.8.4.1 Bangladesh is the third-largest non-EU exporter of bicycles to the EU and the eighth largest exporter overall

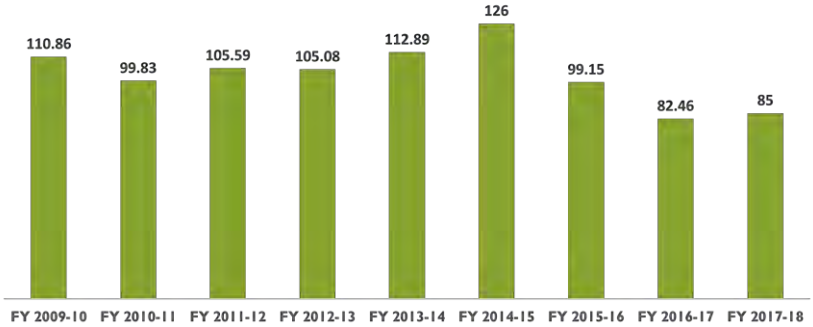


Figure 36: Bicycle export earnings in million $

Bangladesh entered into the EU market after the imposition of anti-dumping on China by European Bicycle Manufacturing Association. It is now the third-largest non-EU exporter of a bicycle after Taiwan and Cambodia. Export earnings from bicycle contributed 12 percent of total light engineering export in FY 2017-18. The local market has also expanded substantially in recent years and growing at around 30 percent every year. Meghna Group is the market leader in bicycle exports, but recently Rangpur Metal Industries, a concern of Pran-RFL Group, doubled its capacity to 600,000 bicycles per year which shows the industries potential. Bangladesh exports bicycles mostly to the European Union (EU) market especially UK, Germany, Netherlands, Italy, Greece, Ireland, Belgium, Denmark, Australia, Portugal, Russia, and India.

According to the *Persistence Market Research*, the global market for bicycles is anticipated to expand by 37.5 percent during the period 2016 and 2024 and the global market size is expected to reach $62 billion by 2024. The domestic market demands nearly 1.5 million bicycles a year, which is increasing every year. Moreover, EU trade policies allow Bangladesh to export bicycles, parts, and accessories to 28 EU countries without the regular 14 percent duty on complete bicycles and 4.7 percent duty on imported parts and accessories. Currently, Bangladesh is the second-largest non-EU exporter of bicycles to the EU and the eighth largest exporter overall. As a result, amid the downward trend of engineering products, the bicycle remains progressive by fetching $85 million in 2017-18 fiscal with a 3.97 percent growth than the previous fiscal.

3.8.4.2 Agro-machinery market sized at $1.2 billion and growing at a twelve percent CAGR

Agro-machinery and spare parts market is booming in Bangladesh. 32 percent of the total machinery requirement is now depending on local production whereas the local agro-machinery manufacturing market size is $407 million. On the other hand, the spare parts market sized at $309 million of which domestic production is estimated at around 80 percent. Bogura and Jashore are often termed as 'Agri-machinery districts' and establishment of special 'Agri-machinery Production Zones (APZ)' in these areas could lead to the exponential growth in the export of such parts.

Figure 28: Agro-machinery market in Bangladesh

According to the Department of Agricultural Extension, in 2009, GoB took up a $17 million scheme to accelerate farm mechanization by offering a 25 percent subsidy for agricultural machinery such as power tillers, tractors, power threshers and combine harvesters. A recent study published by Bangladesh Agricultural University reveals the potential agro-machinery market based on the level of mechanization adopted in the core agricultural tasks. The chart below clearly indicates that a large number of tasks are yet to be mechanized. As a result, the market will grow exponentially and will increase the demand for light engineering.

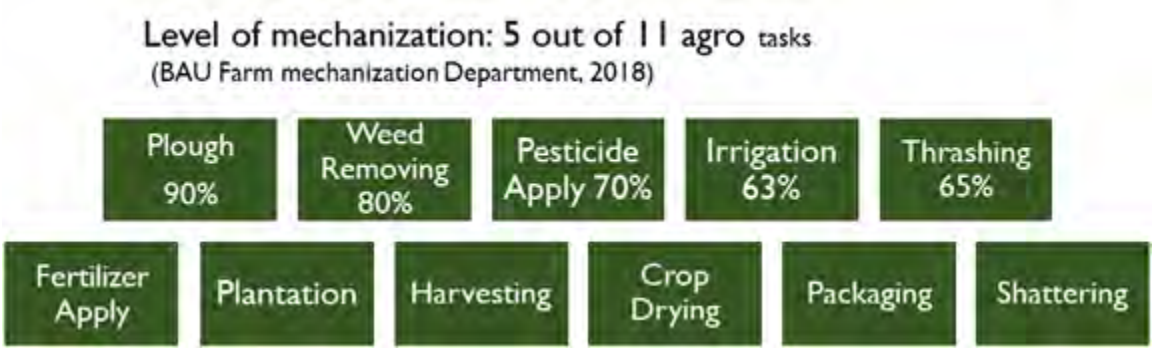


Figure 38: Agro-Mechanization adoption rate in core agro tasks in Bangladesh

3.8.4.3 Automotive spare parts market has grown to $175 million in FY 2017-18 with a CAGR of 10.8 percent

The automotive component market in Bangladesh is three-folded in the last 10 years from $63 million in FY 2007 with a CAGR of 10.8 percent. More than 1,000 enterprises are involved in producing automotive spare parts in Khulna and Bogura districts. Besides the presence of local light engineering enterprises and manufacturers, global giants like Hyundai Motors are planning to set up auto spare parts along with automobile manufacturing plant at its existing assembly plant in Chattogram. However, this market often gets dominated by Chinese imported parts which are much cheaper than locally manufactured one.

3.8.4.4 Domestic light engineering manufacturers can supply essential machines for RMG sector with twenty-five percent low price compared to imported machines.

Leading garment exporters and textile manufacturers are the main buyers of the locally made machinery. A necessary machine such as DLPG film blowing machine costs around $50,000 which would have cost the exporter $700,000 if it had been imported. Other than DLPG film blowing machines, engineering companies also manufacture poly roll, zipper plate, and clamp. For local conglomerates of various sectors such as Square Pharmaceuticals (leading pharmaceutical manufacturer), PRAN-RFL (one of the largest conglomerates), Akij Group (a leading conglomerate), Meridian Foods (renowned consumer packaged goods company), and Bengal Group (a leading conglomerate). Moreover, a number of enterprises have the in-house expertise to repair all kinds of textile machinery.

In conclusion, the light engineering sector has immense potential to grow based on the evidence in domestic market potential as well as export. The estimated potential market size may grow up to $12.06 billion by 2023.

3.8.5 Industry dynamics (challenges)

3.8.5.1 Old conventional machines lower down the quality of design and finishing of the products as well as the overall productivity of the enterprises

Majority of the enterprises depend on backdated and manual technology which is hampering the quality of the finished goods. The enterprises do not use Computer-Aided Numerically Controlled (CNC) machines and Computer-Aided Design (CAD), heat treatment and testing, which are essential to produce identical products and enhance the overall productivity. Therefore, the products are losing competitiveness in the international market comparing the export peers. In contrast, enterprises cannot effort these modern machines and technology based on their current financial performance. The assessment team has found out from the cluster visit that a Common Facility Centre (CFC) in large cluster/hubs can be effective for the enterprises to grow as well as for the sector. This facility will upgrade the quality of existing light engineering products and facilitate new products development in the clusters.

3.8.5.2 The high-interest rate of financing is one of the major constraints for the enterprises to scale their production

Majority of the enterprises are small and mostly operated under the proprietorship and/or family-owned business. Hence, their production capacity is low, and the cost of the product is high. In order to scale their operation, they require financial support to start and operate their businesses But the high-interest rates of loans and convoluted lending procedure to receive are considered as one of the major barriers to scale up productions.

3.8.5.3 Lo-grade raw material with no testing facility is causing lower growth in export earnings

In Bangladesh, the light engineering sector uses mostly ship scraps as input material. In most cases, these input materials are very low quality and are frequently used without any quality check standards. In order to meet the international quality standards, BSTI and other certification bodies need to add new technologies for quality control. Also, skilled manpower to produce high-quality products must be ensured. In this instance, the large enterprises are ahead of the game of creating skilled labor force and getting them certified by renowned governing bodies, which will ultimately help them to perform better in the international market.

Medical equipment

Domestic Market Size	Export	Employment	2023 Market Size
USD 350 M	USD 0.44 M	0.01 M	USD 736 M

3.9 Medical equipment

To provide and ensure quality healthcare services, the need for best quality medicine, medical equipment, and devices. at an affordable price is foremost. Driven by innovation and technological advancement, the global medical equipment industry is transforming the healthcare system worldwide. This industry is globally impacting and improving aspects in diagnosis and treatment with its rapid advancement tendency and technology inclusion. However, in Bangladesh, there's still a lack of advanced technology with very low levels of penetration as well as adoption of modern treatment. This infers that it is a latent opportunity to improve the industry ecosystem and to play a significant role in revolutionizing the country's healthcare services.

3.9.1 Structure of the medical equipment sector: Highly dependent on import

Bangladesh highly depends on imports to supply its healthcare services with modern medical technologies. Currently, the industry comprises of approximately eight medical equipment manufacturers, which supports only 15 percent of the total market demand. The rest 85 percent of the products are import driven. With the growing population, the healthcare sector has a consistent demand for surgical instruments, orthopedic and prosthetic equipment, imaging, orthodontic and dental implants, and electromedical equipment. Bangladeshi medical equipment sector is segregated into five major segments, of which equipment and instruments form the largest portion of the pie in Bangladesh.

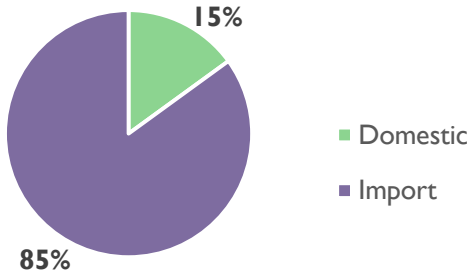


Figure 29: Medical equipment market status quo

Key market shares out of the total medical equipment industry are the following:

Diagnostic imaging: Usage of electromagnetic radiation and other technologies such as X-rays, CT scans, nuclear medicine scans, MRI scan, ultrasound to produce images of internal structures of the body. This is also known as medical imaging and this assists to diagnose a patient accurately.

Consumables and disposables: Medical consumables and equipment include syringes, catheters, needles, sutures, medical gloves, masks, adhesives and sealants for wound dressing and many other instruments which are used for diagnosis or treatment.

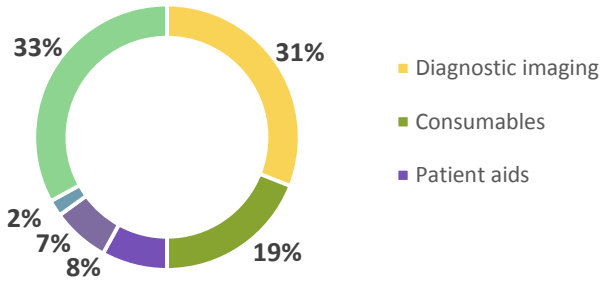


Figure 30: Medical equipment category

Patient aids: A large portion of patient aid segment includes pacemakers and hearing aids. Most of the products are acquired from the USA[35], China, and South Korea.

Orthopedics and prosthetics: Orthopedics include accuracy in the fabrication to be used in different areas of the body particularly in the lower as well as upper limbs, spine or cranium, on the other hand, prosthetics comprises the use of artificial limbs to increase the function and upgrade the life disabled person.

Dental products: Products that are used to improve oral hygiene and care.

3.9.2 Statistics: an infant with huge potential

3.9.2.1 Domestic market

Bangladesh has been unable to capitalize on the medical equipment sector successfully. Yet the market is highly dependent on imports from China and European countries. Still, the industry has gradually grown and experienced an increase from $144 million in FY 2010-11 to $350 million in 2017-18 at a CAGR of 12 percent. Around 90 percent of

[35] Large US companies who are selling medical equipment in Bangladesh: Johnson and Johnson, Stryker Corp, General Electric, Boston Scientific

the local manufacturers are producing medical consumables and diagnosis kits[36] and catering to local consumption with limited exports.

Historically, in Bangladesh, medical equipment production started in 1995 by a local company, Opsonin Pharma Limited; which manufactured mainly, disposable syringes. Later, a number of companies entered the industry including JMI Syringes and Medical Devices Ltd. Getwell, Opso Saline Ltd., Techno Drugs Ltd., and Incepta Pharmaceuticals. On the other hand, another local company, Bi-BEAT limited with a young pool of researchers and tech-enthusiasts is working to develop home-grown affordable medical devices. Its medical devices include anti-sweat, Computerized ECG, Pedograph, Muscle and Nerve Stimulator. Few products of Bi-BEAT Ltd. were recently exported to Sri Lanka and Pakistan and received amazing feedback.

Bangladesh imports various products from a number of leading foreign manufacturers as, Abbott Laboratories, General Electric Healthcare, Johnson and Johnson, Smith and Nephew, Stryker Corp., and Boston Scientific. Among these companies, Siemens Healthcare has a representative office in Bangladesh and Philips Healthcare is represented by few local distributors. (STOCKHOLM, 2015)

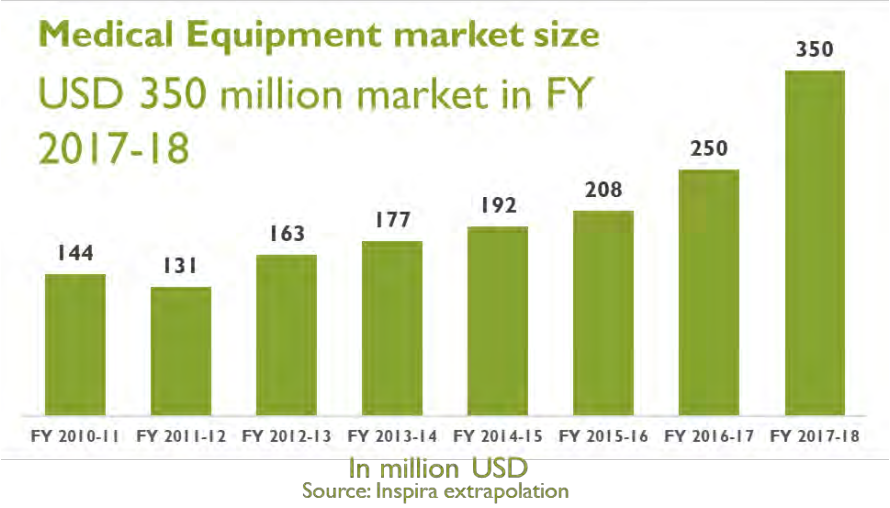


Figure 41: Market size of Bangladesh medical equipment industry

3.9.3 Export market

Among the local manufacturers, *JMI Syringes and Medical Devices* is the market leader with a footprint in exporting medical consumables and diagnostic kits[37]. However, Bangladesh exports very little number of medical devices and it is believed that a modest domestic industry is beginning to form. *JMI's* export earnings increased to $447,491 in FY 2017-18 by 52 percent in comparison to the earnings of $294,080 in FY 2016-17.

Among the medical equipment exporters, JMI and Opso Saline are exporting medical equipment to 27 countries including nine developed countries.

3.9.4 Support interventions in the sector

GoB intervention: A good governance framework of the sector and understanding of the nature of this industry will help to ensure that, the country is poised to capitalize on the opportunities provided by medical technology to improve national healthcare. Emphasizing this issue, the Directorate General of Drug Administration (DGDA) Bangladesh formulated 'The Registration Guidelines for Medical Device, Bangladesh 2015' to regulate medical equipment and devices in Bangladesh under the Ministry of Health and Family Welfare (MoHFW). The newly framed guidelines categorized the medical devices based on the level of risk – 'A' for low risk like surgical retractors, tongue depressors, dressing, gauge

36

37 **Medical consumables**, such as gloves, syringes, bandages, cotton wool, sutures, catheters, tubes, infusion sets, and IV cannulas. **Diagnostic kit** means a commercially prepared reagent set, with accessory devices, containing all of the major components and literature necessary to perform one or more designated diagnostic tests or procedures for either laboratory or personal use.

and bandage; 'B' for low-moderate risk like hypodermic needles and suction equipment; 'C' for moderate-high risk like lung ventilators and bone fixation plate; and 'D' for high risk like heart valves and implantable defibrillator.

The guidelines maintain the proper implementation of regulatory controls for manufacturing processes in order to safeguard the health and safety of patients, users and other concerns. It aims to ensure that private sector actors (manufacturers of medical devices) follow specified procedures during design, manufacture, and marketing. The guidelines further suggest that regulatory controls should be proportional to the level of risk associated with a medical device. In general, the classification rules are intended to accommodate new technologies. It also implemented conformity assessment measures to find out the manufacturer's quality management system for the products in accordance with ISO 13485:2003[38]. Although GoB has exempted VAT in a number of necessary medical equipment, no cash or duty benefits are provided to the manufacturers.

Partnerships with international technical collaborators: In Bangladesh, leading local manufacturers use high-quality raw materials from various local sources, including international reputed sources such as Japan, South Korea, and China. JMI syringes also have a technical collaboration with Star Syringe Ltd. of UK and Sunmyung International of South Korea which in turn helps to ensure export quality products. Accreditation from EN ISO 13485: 2012, WHO PQS and GMP Certification are also bagged by the leading exporters.

3.9.5 SWOT: upcoming opportunities and challenges

Opportunities: Importing more than 85 percent of the sophisticated devices at present, the domestic industry has a huge scope for Research and Development capacity to come up with import substitutes. Global medical devices market is expected to reach $545 billion by 2020, thereby widening the export potential of medical equipment items

A large amount of growing demand for medical devices is also influenced by the aging population all over the world. In line with that, Bangladesh's aging population is to hit 50 million by 2050 (Dhaka Tribune, 2013), thus increasing the demand for home-based healthcare devices. Industry players should look for this opportunity and explore this market.

In addition, the number of high-tech surgeries such as kidney transplantation, and comprehensive cancer treatment are increasing in the country- this is also an indicator of increased usage of high-quality medical consumables. The local manufacturers should strategically cater to this market in order to decrease import dependency. Moreover, some treatments such as hematology and bone marrow transplantation require equipment like liquid nitrogen freezers, transfusion machines and interventional radiology. These hi-tech machines could be manufactured by the local manufacturers with increased investment in R&D, sophisticated technology and through joint venture partnerships with foreign technical partners.

Challenges: Duty policies for this sector are not favorable as a huge portion of the cost of production comprises the duty fee on imported raw materials. Mostly the price of the finished goods with import duty is lower than the locally manufactured products. This can be controlled by decreasing the import duty on the raw materials which in turn will encourage the local manufacturers to produce products at competitive prices.

It is also acknowledged among the market Players that, there's no system in place or too little standards to examine the quality of the imported products. In addition, dealers claimed that sometimes importers bring in unaccredited, unauthorized equipment that may cause infection. If domestic producers produce surgical equipment, then it is possible to save a considerable amount of money and get quality products.

[38] ISO 13485:2003 (Medical device quality management system, required for regulatory purposes). The primary objective of ISO 13485:2003 is to facilitate harmonized medical device regulatory requirements for quality management systems. As a result, it includes some particular requirements for medical devices and excludes some of the requirements of ISO 9001 that are not appropriate as regulatory requirements.

Pharmaceuticals

Domestic Market Size	Export	Employment	2023 Market Size
USD 2.44 B	USD 103.46 M	0.172 M	USD 7.6 B

3.10 Pharmaceuticals

Bangladesh pharmaceutical sector evolved from an import-dependent to self-reliant sector within two decades. The industry was ninety times smaller in 1980's compared to FY 2017-18. Bangladesh is the only least developed countries (LDC) that has a well-developed pharmaceuticals sector. Industry-friendly policies, large domestic consumer base and improved health consciousness have driven such growth.

3.10.1 Structure of the sector

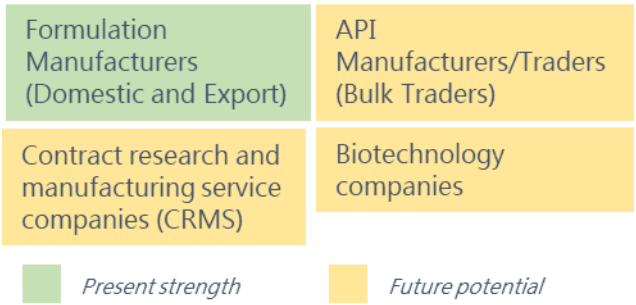


Figure 31: Key segments of pharmaceuticals sectors

The figure illustrated the key segments of pharmaceuticals firms and present strength of Bangladesh. All the Bangladeshi pharmaceutical firms (over 257) are formulation manufacturers mostly producing generic drugs[39]. Top 10 firms also export to the international market. Few firms started API manufacturing in small scale and contract manufacturing of branded drugs for developed countries, which has stronger regulations and system in place. Bangladeshi firms only focused on the final stage of drug manufacturing but have future potential in API, CRMS, and Biotechnology segment. MNCs (above 6) also established manufacturing plant in Bangladesh but they mostly focused on specialized licensed drugs such as cardiovascular, oncology, and diabetes medicine.

3.10.2 Sector statistics: domestic market

The pharmaceutical sector sized at $2.44 billion in FY 2017-18[40], has remained on a strong growth trajectory over the past few years with a CAGR of 17.27 percent in five years (2013-18). The sector has emerged as one of the fastest-growing manufacturing industries, roughly contributing one percent of the country's GDP in FY 2017-18 (was 0.93 percent of GDP in 1996). The domestic market comprises the 99.5 percent of the market size where export figure remains very low as it has crossed 100 million this fiscal year FY 2017-18.

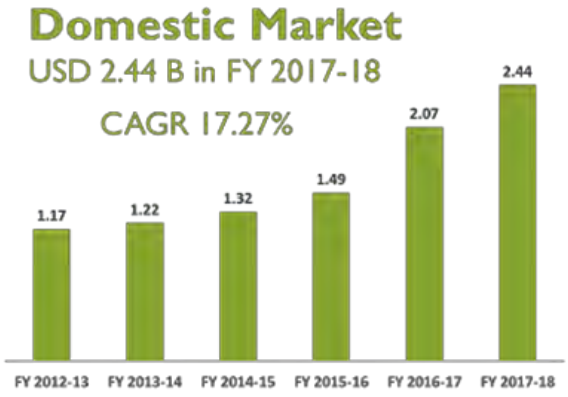


Figure 32: Domestic market size and compound annual growth rate of pharmaceutical industry in billion

As of 2017, the sector is highly fragmented with local producers. Out of these, the top five formulation companies are accounted for nearly fifty percent of the market and the top ten dominated seventy percent where foreign MNCs enjoy only 10.5 percent of the market share.

Total job creation is nearly 172,000 in this sector where distribution and marketing contribute nearly 80 percent of the jobs. According to industry insiders, production is highly dominated by white-collar jobs (pharmacists and chemists). Female contribution in the workforce is very low in the manufacturing plants. In the distribution and marketing segment- there is no scope of female contribution as it requires high field engagement. Yet, there are few female workers who are engaged in consulting with village women and providing medical services.

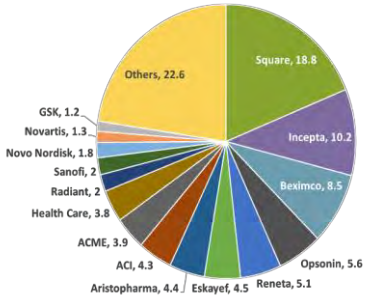


Figure 33: Market share of Bangladesh pharmaceuticals companies

[39] *Generic Drugs* mostly refers to original medicines no longer on patent, used for treatn quality, efficacy and safety- with a reliable supply. It should be noted that branded *Generic Drugs* are different from *Branded Drugs* or *Innovator Drugs.*

[40] The estimation is made for only allopathic medicines only. (Source: Research report 2 WTO decision on TRIPS and Public health: A window of opportunity for Bangladesh's pharmaceuticals industry 2017). Retrieved from https://cpd.org.bd/wp-content/uploads/2018/08/Research-Report-2-Rahman-and-Farin-2018_WTO-Decision-on-TRIPS-and-Public-Health.pdf Last visited on February 19, 2019

Local players are focused on generic drugs as 80 percent of medicine brands belong to generics drugs, alimentary treatment and metabolism being the leading categories. Whereas, foreign MNCs focus on specialized products more. Square Pharmaceutical is leading the market as a local player with 18.8 percent market share, followed by Incepta pharmaceuticals; Beximco Pharmaceuticals are second and third respectively. Radiant, Sanofi, and Novonordics are the leaders among the foreign companies.

The domestic market is highly dominated by physician-driven generic branded drugs, particularly in three major categories and sixteen therapeutic classes. Categories: i. Gastro-intestinal ii. Antibiotics iii. Antipyretics. Class: (Top five grabs 82 percent of the market share). i. Alimentary T. and Metabolism ii. Systemic Anti-infective iii. Nervous system iv. Cardiovascular v. Respiratory.

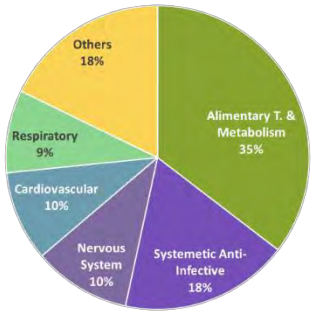


Figure 34: Market share of therapeutic class of pharma products

The pharmaceutical business thrives on acidity drugs. The top selling product of the sector is SECLO (produced by Square Pharmaceuticals) with an annual sale of $45 million (2% of the market). Six of the top 10 best-selling medicine brands in Bangladesh are from this group, according to Bangladesh Investment Guide 2018 conducted by local financial service institution LankgaBangla. The sales trend, however, does not mean that such a large number of people in Bangladesh are suffering from acidity, rather, illiteracy and lack of awareness among the people and business of drug producers and sellers are the reasons for such high sales of these drugs.

3.10.3 Sector statistics: export earnings

The pharmaceutical export figure in FY 2017-18 stood at $103.46 million, with a CAGR of 7.71percent in 10 years (FY 2008-9 to FY 2017-18). Pharmaceuticals export earnings contribute only 0.28 percent of the total export basket of our country in FY 2017-18 and showed a positive trend in the last 10 years. It has maintained double-digit annual growth in the last five years.

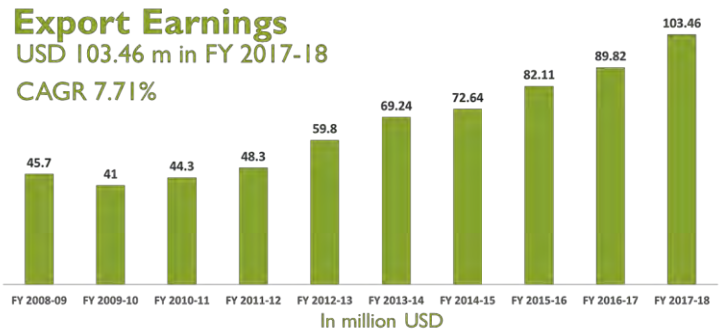


Figure 35: Export market size and compound annual average growth rate of export earnings

3.10.3.1 Number of export market destinations

According to Bangladesh Association of Pharmaceuticals Industries (BAPI), 54 companies from Bangladesh are exporting to more than 127 countries around the world, where top seven countries are, Myanmar, Sri Lanka, Philippines, Vietnam, Afghanistan, Kenya, and Slovenia. Other market includes Oman, Yemen, Thailand, Nepal, Singapore, Bhutan, Central Asia, and Africa. Top seven countries hold a combined share of 60 percent of the total pharmaceuticals export.

Bangladeshi firms cannot strongly penetrate in the US and EU market which are the biggest market destination in the global pharmaceutical space. According to BAPI recently, few firms have received US-FDA and EMA permission of 1,200 medicine brand, which will result in an increase of export earnings from the US and EU market in the next three years.

3.10.4 Support available for the industry

3.10.4.1 Policy support

In terms of policies, the pharmaceutical industry is the most favorable industry in Bangladesh. GoB has a special focus on accelerating pharmaceutical export and reduces import dependency. In the recent export policy 2018-21, the government announced API and pharmaceutical reagents as the highest priority sector. In addition, the Ministry of Commerce published the National Active Pharmaceutical Ingredients and Laboratory Reagents Production and Export Policy. The policies have set the aim of reducing the raw materials import dependency to 25 percent by 2032 from 97 percent in 2016. It also plans to increase export earnings and create 500,000 jobs by 2032.

National drug policy 2016 is highly focused on the necessity to be adequately prepared to ensure compliance with the TRIPS agreement, establish an effective surveillance system for medicine, and regularly update and publish the online price of essential drugs under Bangladesh National Formulary. It also focused on the need for cGMP (current GMP) accreditation for boosting export earnings.

Ministry of Commerce published the National Active Pharmaceutical Ingredients (API) and Laboratory Reagents Production and Export Policy recently after getting an approval of the government high-ups. Active pharmaceutical ingredients (API) and laboratory reagents manufacturers of the country will get corporate tax holiday till 2032 along with a set of other incentives, according to a national policy on the sector. The aim of the policy is to reduce dependency on import of API, increase local production, diversify export and attract an additional $1 billion foreign direct investment in the sector. Currently, local industries meet 98 percent of domestic demand for medicine, according to the preamble of the policy.

3.10.4.2 Fiscal support

Pharmaceutical manufacturers are enjoying 10 percent cars incentive for exporting pharma products. Formulation manufacturers will also get a duty-free facility in import, priority in getting a land allocation at the government's special economic zones and export processing zones. Recently, the government announced a 20 percent cash incentive on the export of API and laboratory reagents. At the same time, the industry under Tax Holiday scheme by NBR. Local manufacturers will also get support in foreign currency policy, like the duration of delayed payment for import of raw materials will be extended to 360 days from the existing 180 days. Entrepreneurs will be able to get loans from offshore funds and the tenure of term loans for factories and equipment could be 12 years instead of six years. They will also be allowed to retain 40 percent of their export earnings as export retention quota and will get back-to-back LC facility like in the readymade garment sector.

In FY 2018-19 budget the government proposed exemption and reduced rate of duty on a number of raw materials including that of cancer medicine, and raw materials of API. 12 items were reduced duties from existing 10 percent to five percent and eight items from 25 percent to 15 percent. The VAT on the number of pharmaceuticals ingredients reduced to zero from 15 percent.

3.10.4.3 Quality of required infrastructure

API Industrial Park consisting of 42 plots on 200 acres of land in Munshiganj (cost: $30 million), which is considered the most valuable infrastructure project for the Pharmaceutical industry. It was expected to be operational by 2011 but the construction work was delayed. Half of the companies has got ready plots and expected to go into operation by 2019. API industrial park can also open international API market to Bangladesh.

Bangladesh pharmaceutical industry is still lagging in quality infrastructure in bioequivalence lab and clinical research. Labs equipped with modern research facilities are necessary as, currently, firms are using facilities in Malaysia and India for bioequivalence tests. To facilitate the support, a joint initiative named Bangladesh Clinical Research and Organizations was proposed in 2015 which would require $50 million to build. Since Bangladesh is relentlessly trying to expand the generics products into the regulated market, investment in building Clinical Research Organization (CRO) will expedite the business venture in the global market in a cost-effective manner.

3.10.5 Sustainability of the ecosystem

Pharmaceutical waste is highly associated with environmental contamination as it can create serious water pollution resulting in complex health hazard. The good news is that all the top pharmaceuticals manufacturing firms have installed ETP as per GMP and maintain high environmental safety. API industrial park also has a central ETP which will ensure the discharge of non-contaminated water directly to Meghna river. Pharmaceutical manufacturing falls under 'Green' category in availing *Environmental Clearance Certificate,* referring to no negative effect on the environment declared by the Department of Environment. Therefore, entrepreneurs do not need any clearance from the local authority.

3.10.6 SWOT (strength)

3.10.6.1 Cross-sector value addition potential

Pharmaceutical packaging has high impact potential in cross-sector value addition to plastic industry as 30 local pharmaceutical plastic packaging material producers are capturing almost 70 percent of the local market *(Md. Abu Zafor Sadek, Pharmaceutical Plastic Packaging Market in Bangladesh: A Study on Demand-Supply Scenario and Strategic Imperatives for Local Enterprises, 2017)*. Considering the compatibility, stability, transport, and other safety issue pharmaceutical companies are mostly depending on plastic materials for packaging purposes which is boosting the growth of the plastic industry of Bangladesh. In Bangladesh, Siddique Plastic and Luna Plastic were the early-stage market players in 1978, thereafter many companies such as Bengal plastic, Islam Plastic, Padma Plastic, Polycon, Asia Plastic, Bismillah Plastic have become the top producers of plastic packaging material for local pharmaceutical companies. For pharmaceuticals, these companies are producing some core packaging products are: PET bottle, spoon, measuring cup, dropper, and nozzle. The market size of pharmaceuticals packaging sector is approximately $25 million which is growing with a CAGR of 25 percent. Top two pharmaceutical companies create one-fourth of the market demand. The table shown below indicates the demand distribution of plastic packaging for pharmaceuticals.

Among many different forms of plastic packaging materials that are being used in the pharmaceutical sector, PVDC film, PVC film, and PET bottle together account for 36 percent of the total value. The table shown below explains the major plastic materials used in pharmaceuticals and their respective share,

Table 10: Pharmaceutical packaging industry market share

Products	**Source**	**percent Contribution by value**
PVDC/HDP Film	Local/Import	14
PVC Film	Local/Import	12
PET bottle	Local Manufacturer	11
Cap and Closure	Local Manufacturer	8
Measuring Spoon	Local Manufacturer	6
Eye Drop bottle	Local/Import	5
Nasal drop bottle	Local/Import	5
LVP container (flex)	Local Manufacturer	5
Dropper	Local Manufacturer	5
LVP Container (non-flex)	Import	5
Special Tube-type container	Import	5
Syringe	Local Manufacturer	4
Infusion Set	Import/Local	4
Measuring Cup	Local Manufacturer	3
Stopper	Local/Import	2

3.10.7 Weakness and opportunities

3.10.7.1 Domestic value addition

Pharmaceuticals raw materials include active pharmaceutical ingredients, excipients and packaging materials where local pharmaceuticals firms can produce nearly 15 percent of the API which is the main raw material of pharma goods. Bangladesh imports API worth $730 (FY 2017-18) million annually from India, China, Korea, and Germany. It is estimated to reach $1.4 billion by 2025 (Mustafizur Rahman, 2018). Majority of APIs come from China and India and it was found that nearly 40 percent come from China and 30 percent from India, and the rest of the materials imported from other countries like Korea, Germany, and Finland.

Bangladesh focuses only in the final stage of drug manufacturing and highly depends on the import of raw materials (Active Pharmaceuticals Ingredients), these ingredients comprise of around 40 to 50 percent of the drug making cost (BANK, 2016). This cost narrowed down the profit margin of less than 10 percent which is less than our export peers India and China. Where having the process of making complete final formulation has a 20 to 30 percent profit margin. Therefore, Bangladesh is lagging in expanding of the pharmaceuticals export.

The Pharmaceutical Industry is characterized by the maintenance of high-quality standards as it concerns the lives of people. The stringency of regulatory procedures varies across countries. Regulated markets include the USA, the EU, and Japan that have established systems of patent laws and sophisticated regulatory systems for controlling drug quality. On the other hand, semi-regulated markets include countries such as China, India, and South Africa, which have less stringent systems of patent laws and less sophisticated regulatory systems for drug quality control. Local firms are also lagging in gaining such standards, but tops firms are slowly achieving success in generics products. Bioequivalence labs and modern research facilities equipped with skilled scientist are necessary for strongly competing with export peers. Currently, Bangladeshi firms borrow the technology from Malaysia and India for

If the bioequivalence tests facility can be built, the sector will have an additional income of $1 billion from clinical research subsector.

3.10.7.2 Shifting diseases profile from acute to chronic

The average life expectancy of Bangladeshi citizen increased from 66.4 years (2002) to 72.2 years (2012). About 34.2 million of the Bangladeshi citizens are likely to be aged over 50 years by the end of 2026. Improved health consciousness among mass people has reduced the proliferation of acute diseases, while chronic diseases are expected to grow significantly. As a result, old people are in a threat of affecting by four major non-communicable diseases: cardiovascular diseases, cancer, diabetes and chronic respiratory diseases (BANGLADESH PHARMACEUTICAL INDUSTRY: LR GLOBAL INDUSTRY INSIGHTS 2017).

3.10.7.3 Rise of non-communicable diseases among Bangladeshi citizens

About 25 percent of the Bangladeshi citizens are likely to be aged over 50 years by the end of 2036. The average life expectancy of Bangladeshi citizen increased from 66.4 years (2002) to 72.2 years (2012). Old people are in a threat of affecting by four major non-communicable diseases: cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases. Improved health consciousness among mass people has reduced the proliferation of acute diseases while chronic diseases are expected to grow significantly. Changing lifestyle and food adulteration effects are the major reason behind shifting diseases profile.

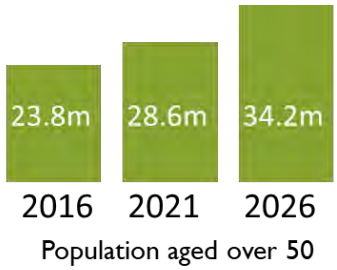


Figure 36: Population projections based on the current situation

3.10.7.4 Increased pharmaceutical sales point

Availability of drugs in nearby pharmacies will be expanding due to the fast growth of distribution efforts by local pharmaceutical companies, and rapid expansion of retail business by local entrepreneurs. In addition, the bottom-of-the-pyramid population of Bangladesh, 15 million people is expected to rise above the poverty by 2020. This will be the next untapped market for pharma sales.

Private hospitals are expanding in tier-2, tier-3 cities which will increase the overall pharma sales in the peri-urban and rural region.

The sector will spur the current growth rate in the domestic market and the sub-sector will expand rapidly as well. In the global market, the sector is expected to achieve a steady growth however the amount will not be increased significantly due to high competition. Based on the evidence the sector is expected to hit $7.6 billion by 2023.

3.10.7.5 Public health concern: superbugs and rise of AMR in Bangladesh

Global Perspective: For nearly a century, bacteria-fighting drugs known as *antibiotics* have helped control and destroy many of the harmful organisms that can make human beings sick. But in recent decades, overuse and misuse of antibiotics has prompted some strains of bacteria to make a small change in their DNA and become antibiotic-resistant "superbugs". The global threat posed by superbugs[41] is expected to skyrocket in the coming decades and unless effective measures are taken, 10 million people could die annually by 2050 from AMR (Antimicrobial Resistance), a report warned in 2016. *That figure is higher than the total number of people who died from cancer, diabetes and diarrhea in 2018*.

Bangladesh scenario: Bangladesh, India and Pakistan are seen as drivers of antimicrobial resistance (AMR) because of poor adherence to antibiotic treatment, the non-therapeutic use of antibiotics for growth promotion in farm animals, self-medication and illegal over-the-counter access to antibiotics. A 2015 study published in the European Journal of Scientific Research found that over one-third of patients in Bangladesh surveyed were given antibiotics by people without authorization to do so. This trend has serious public health consequences as evidenced by the fact that around 80 percent of deaths in Bangladesh's biggest intensive care unit (ICU) at Bangabandhu Sheikh Mujib Medical University (BSMMU) was linked to AMR.

Closer look: A deeper dive into this issue would unearth some of the most horrible and unscrupulous business practices across diverse industry verticals. In Bangladesh, antibiotics intended for human usage are also given to animals in a bid to make them fatter quickly and thus generate more profit. In Chattogram, it was found that over half of poultry chickens were infected with multi-drug resistant bacteria. A government study[42] has found various types of antibiotics in almost 50 percent poultry feed samples of 14 brands collected from four districts. These antibiotics found in poultry are popularly known as gross spectrum antibiotics - used for a number of diseases, and they are a serious public health threat. These antibiotics create antibiotic-resistant microorganisms in poultry. If such chickens are consumed, the microorganisms will enter the human body and multiply.

Although there is no exact data, a DMI laboratory analysis based on infections on patients' body from 2010 to 2018 depicted a sharp rise in the number of superbugs in Bangladesh. In 2010, superbugs and multi-drug resistant (MDR) bacteria were detected in 6.5 percent cases. But it increased to 11 to 15 percent in 2018, according to the study. Use of counterfeit or poor quality of antimicrobial medicines, weak laboratory capacity, and inadequate drug monitoring and surveillance are among the main reasons behind the rise of AMR bacteria in Bangladesh[43].

The size of local pharmaceutical market is worth $2.2 billion. of which, 18 percent is occupied by antibiotic drugs which indicates "indiscriminate use of antibiotic drugs". In summary, AMR growth is happening in Bangladesh owing to poor treatment adherence, non-therapeutic use of antibiotics for growth promotion in farm animals, self-medication and over-the-counter access to antibiotics. This is a critical healthcare challenge which needs to be addressed. Our discussion with domestic pharmaceutical companies indicated that they were interested to partner up with initiatives to create nationwide awareness regarding the matter.

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[41] Superbug: a term used to describe strains of bacteria that are resistant to the majority of antibiotics commonly used today

[42] Study titled "Value Addition and Standardization of Nutritional Level in Selected Food items from Animal and Poultry Origin" was conducted jointly by the Bangladesh Agricultural Research Council (BARC) and Patuakhali Science and Technology University.

[43] Global Antibiotic Resistance Partnership (GARP) report titled "Antibiotic Use and Resistance in Bangladesh 2018"

Plastic

Domestic Market Size	Export	Employment	2023 Market Size
USD 1.8 B	USD 1 B	1.2 M	USD 7.2 B

3.11 Plastic

The plastic industry is one of the few industries outside textiles, apparels, leather, and jute which have contributed towards export diversification. Although the plastic industry has started as a backward linkage industry for export-oriented sectors, it has evolved as an important industry itself for Bangladesh economy. Plastic has a diverse cross-cutting relationship with other sectors such as RMG, healthcare, automotive, and retailing as their backward linkage for plastic parts. Even at the end of their lives, plastics are still a very valuable resource which can be recycled for plastic manufacturing.

3.11.1 Structure of the sector

Plastic is a synthetic material made from a wide range of organic polymers such as polyethylene, nylon, HDPE, PVC, and LDPE. Because of the unavailability of such raw materials in Bangladesh, the industry is almost entirely dependent on imports. Polyethylene Terephthalate (PETE or PET) and Polypropylene (PP) are the most used raw material for plastic manufacturing in Bangladesh. The plastic industry represents a sizeable sub-sector in accessories of RMG, household and kitchenware products, furniture ware, packaging of all kinds of food and nonfood products, healthcare and medical accessories, electrical and electronics equipment, automotive parts, construction material, toys, plastic recycling and many more.

Plastic is the 12th highest export earning sector in Bangladesh where the export market is highly driven by large scale players who have demonstrated the capability to be world-class in terms of technology, quality, and costs. However, among 5,000 plastic manufacturing units, 98 percent belong to the SMEs. The large players of the industry follow "Own account manufacturing" business model where they market their products in own brand name, serving both in the domestic and international market. On the other hand, the small-scale enterprises follow "contract manufacturing" business model where they market their products only in the domestic market especially in the household segment.

3.11.2 Statistics of industry

3.11.2.1 Plastic products

The total market size of the plastics industry is approximately $2.9 billion in FY 2017-18. The domestic demand for the same year was reported at $1.9 billion with 20 percent year on year growth (The Daily Star, 2018). The average plastic consumption in Bangladesh is about six kg per capita in contrast; it is 11 kg in India, 17 kg in Indonesia, 35 kg in Malaysia and 40 kg in Thailand (The Financial Express, 2018).

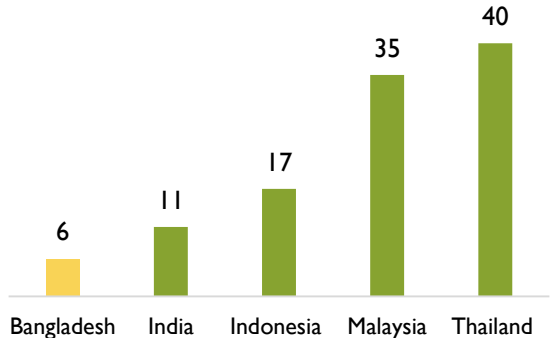


Figure 37: Annual plastic consumption per capita, KG

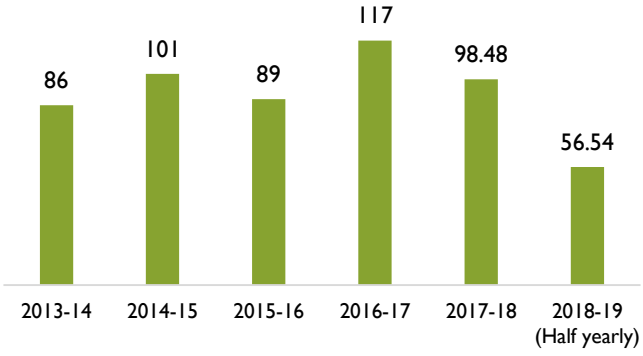


Figure 38: Plastic export, $ million

At the same time, the total export of FY 2017-18 was approximately $1 billion, 90 percent of which is *deemed export* and the rest is the direct export (Amir Hossain Amu, Ministry of Industries, 2018). The direct export of $98.48 million consists of the majority of household plastic goods, toys and kitchenware (The Independent BD, 2018). The $900 million deemed export includes plastic hangers, PP-woven polypropylene bags, and fax fiber bags. However, the EPB export data does not provide information on deemed export of plastic products separately. As a result, its actual contribution to the export basket is not fully come out from the published data. Furthermore, the direct export earnings from plastic products have dropped by 16 percent in FY 2017-18, compared to $117 million in FY 2016-17 (The Independent BD, 2018). The drop was mainly caused by the increased raw material price in the international market which led many companies to fail in importing necessary raw materials which eventually resulted in lower production. However, in the first half of FY 2018-19, the export of plastic goods has marked a 21 percent raise over the

corresponding period of last fiscal year, resulting in the export of $56.54 million within December 2018 (EPB, 2018). Bangladesh is currently exporting plastic goods to over 68 countries such as the US, Canada, Europe, China, India, Nepal and many more and the number is increasing every day. With a similar growth trend both in domestic and export market, impact from potential opportunities and minimize challenges, the industry is expected to reach $7.2 billion at the end of 2023 (Inspira extrapolation, 2019).

3.11.2.2 Plastic toy

At the same time, plastic toys have been added to the special development-oriented sectors in Bangladesh *7th five-year plan* as it has shown tremendous growth of 2075 times in the last five years (Financial Express Bangladesh, 2019). To support the growth of toys further, the import duty on raw material and manufacturing inputs have been decreased to five percent in FY 2015-16, which used to be 25 percent in the past.

Case study: Plastic toys

In 2010, the import of toys totaled $600 million, which has now come down to $200 million, as the local manufacturers enhanced their skills and developed a professional depth of know-how of the industry over time. The domestic demand for toys right now is approximately $1 billion, 60 percent of which is met by the local manufacturers. The export of plastic toys has also shown tremendous growth of 2075 times in last one decade. The foreign investment in this sector is estimated to be nearly $60 million to $100 million and the figure is likely to increase more by 2020. Over 40,000 people are directly working in toy manufacturing, 60 percent of who are female. Presently, around 100 toymakers are producing 800 to 1,000 toy items in the country. Among them, Hakkani Hark Group, Kabir Garden Industries, and Aman Plastic Industries hold the major market share in the toy market. Furthermore, the local entrepreneurs are seeking to team up with Chinese toymakers as China is considering shutting down the toy industry terming it less profitable and small industry.

Source: Retrieved from Financial Express newspaper article named "Toymakers eye global market" published on February 2018.

3.11.2.3 Contribution in Ready Made Garments (RMG)

Apparel accessory makers and packagers provide one of the most important backward linkages to the country's Ready-Made Garments (RMG) sector with direct exports increasing by 10 percent to 15 percent to nearly $1 billion in FY 2017-18. The plastic industry alone contributes around $900 million to the garments accessories and packaging market (The Independent, 2018). The export earnings in the segment are expected to increase up to three times over the next few years. Garments accessories and allied products, such as hangers, buttons, clips, collarbones and collar chips, are supplied by local plastic suppliers. Due to such contribution to the economy, the industry insiders believe that *Apparel accessory makers and packagers* should not be treated as a backward linkage industry rather should be recognized and categorized as an independent entity.

3.11.3 Employment inclusion

In terms of employment generation, there are approximately 1.2 million people connected directly and indirectly in the industry. Around 200,000 people are working in small units, 500,000 in medium and 100,000 in large enterprises (The Daily Star, 2018). Besides, 600,000 million people are indirectly working with the sector. At the same time, the plastic recycling industry is composed of 300 small units, employing more than 25,000 workers (The Financial Express, 2018). In terms of the job multiplier effect of the industry, with a change in demand of $1 million, the plastic industry can generate 265 additional jobs.

3.11.4 Sectoral support

3.11.4.1 Fiscal support

- **Cash incentive:** The government of Bangladesh is offering a 10 percent cash incentive on the export of plastic products (BIDA, 2018).
- **Tax holiday:** Not Available
- **VAT exemption for import:** Duty-free import of all types of raw materials and machinery for export-oriented plastic products.

3.11.4.2 Non-fiscal support

- **Presence of sectoral roadmap:** There is no presence of roadmap to support the industry yet.

- **Presence in export policy 2018-19:** To support the export market, plastic products have been identified as the *highest priority sector* in Export Policy 2018-21.

- **Presence in BIDA potential sector:** Plastic industry is also identified as a potential sector by BIDA.

- **Presence in industry policy 2016:** Recognizing its potential in both domestic and export market Bangladesh Government has included plastic as a priority sector in National Industrial Policy 2016

- **Presence in the economic zone:** To boost the growth of the sector has been added in the planning of Abdul Monem Economic Zone (AMEZ).

3.11.4.3 Other supports

To ensure the human resource development of the sector BIPET has a specific curriculum to enhance expertise in the plastic industry. Along with BIPET, SEIP, BPGMEA, BITAC also provides training and skill development facility to increase capacity and expertise.

3.11.5 Sustainability of the ecosystem

3.11.5.1 Employee and social inclusion

Plastic is a highly labor-intensive sector with a presence of 28 percent female employee (The Financial Express, 2018). The industry consists of 85 percent unskilled workforce (SEIP, 2017) who is gradually turned into semi-skilled and skilled labor through on the job training. In terms of inclusion of PwD and third gender, most industry experts have suggested that with proper inclusion policy and category of work it is possible to include them in the workforce. However, as most plastic clusters are focused on a major city, the inclusion potentiality of an ethnic minority group is less compared to other sectors.

On the other hand, the working conditions of factories in small and medium enterprises are not complaint enough which results in exposure to hazardous chemical and combustible elements along with usage of high-risk equipment without proving required training. At the same time, unfortunately, forced child labor with very low or no payment is highly common in the plastic industry, especially in small enterprises.

When it comes to the quality of the plastic, there is no policy regulation either regarding toxic plastic material and metals present in plastic products which are being imported and exported out to around the world. There is a high presence of toxic substances and heavy metals that are being manufactured in Bangladesh which are above the recommended limit in the US and EU market. Such plastic products with high levels of lead, mercury, cadmium, bromine, and chromium possess health risks like learning disability, hormone problems, and cancer.

3.11.5.2 Environment compliances

The plastic industry cannot ignore the environmental concerns in the process of production of plastic goods. The export competitiveness for sustainable plastic industries is another issue to be handled very carefully, without which the sector might experience a similar fall as leather and leather goods industry. The industry falls under the "Orange - B" category in Environmental Clearance Certificate. Orange B refers to higher negative footprint to the environment where the industries have to report on the Environmental Management Plan (EMP), the Process Flow Diagram, Layout Plan of Effluent Treatment Plant and information about its effectiveness and no objection certificate from the local authority.

Plastic contributes more than eight percent of the country's waste which is equivalent to 800,000 tons, of which around 200,000 tons go into the ocean and rivers (The Financial Express, June 2018). Though Bangladesh was the first country in the world to ban plastic bags in 2002, there are no specific laws, rules or guidelines for plastic waste management. Also, proper management and operation of the supply chain of recycling plastic waste are absent. To make matters worse, water channels such as rivers, are used for dumping industrial and domestic wastes that contain a huge amount of plastic and ultimately end up in the sea. Meanwhile, the top players of the industry believe that the manufacturers are not the reason of environment pollution, rather it is the consumers who are to be held responsible in the matter of plastic

pollution. The alarming news is, except few big players most do not follow environmental compliances properly. However, on the positive side, all the plastic factories will have to set up effluent treatment plants (ETPs) to curb pollution caused by the factories (Minister Mr. Amir Hossain Amu, 2017).

3.11.6 Plastic recycling

Plastic recycling has developed into a sizeable component of the plastics industry, however, the lack of control and structure in the waste management makes it difficult to recycle plastic waste. Recycled resin manufacturing can have immense potentials if it can be recycled in a proper way and adequate structure of plastic recycling can also support in minimizing import dependency of plastic raw material. Around 70 percent of the plastic items generated in Bangladesh are recycled through an informal source which does not health and safety and environmental compliance (The Financial Express, June 2018). To support the recycling industry, BPCL and Waste Concern have been working to minimize the negative footprint from the environment.

From the concept of creating worth out of waste, Bangladesh Petrochemical Company Limited (BPCL) started a post-consumer PET bottle recycling plant in Bangladesh. BPCL plans to recycle all of this plastic waste and turn it into usable raw material. Its operations are solely built on the 'recover and recycle' business model. Starting July 2012, BPCL set up a plant capable of producing 10,500 metric tons of recycled PET resin per year from waste PET bottles. The company recently came up with a plan to start collecting plastic waste on a weekly basis from people's homes (Dhaka Tribune, 2018).

Waste Concern was founded in 1996 with the motto "Waste is a Resource". The company started out as a decentralized community model for waste recycling to transform the solid waste into organic compost using low cost, low technology, and labor-intensive method. Waste Concern collects rubbish for recycling and taken through several food processing centers that turn 100 tons of garbage into compost daily. Since its launch, Waste Concern has served 30,000 people in Dhaka city and 100,000 people in 14 other cities and towns in Bangladesh, including slums and low and middle-income communities (Waste Concern Bangladesh, 2016).

Rise of organic substitute

Bangladesh is reportedly 10th in plastic waste disposal in the world. Every year, 14 million polythene bags are deposited into wetlands from Dhaka city's plastic waste. To minimize the use of the non-recyclable plastic bag, the organic polybag can be the eco-friendly substitute. A Bangladeshi scientist, Dr. Mubarak Ahmad Khan, chief scientific officer at Bangladesh Jute Mills Corporation, has synthesized a polymer from jute fiber which can be used to create a kind of bag that works, looks and feels like a polythene bag but without the negative environmental impact.

Ecospear, a local company, is producing the products in Bangladesh as a substitute of polythene bags and plastic, which is harmful to the environment and human health. Ecospear has introduced biodegradable and eco-friendly polybag, cup, straw, food boxes, and other products in the local market. The newly launched poly bag looks like plastic bags, but those are made from biodegradable materials like natural cassava starch that breaks down over a period of months on land or at sea. This material dissolves instantly in hot water.

Source: Retrieved from a Daily Sun report named "Organic poly bags: A remedy for pollution" published by ANM Mohibub Uz Zaman on 28 July 2018.

3.11.7 Opportunities for the industry

Plastic economic zone: The construction of an industrial zone for plastic goods manufacturers is in the process. ECNEC has approved the $150 million project for the industrial zone at Munshiganj district to promote an environment-friendly plastic industry. The small plastic factories in Old Dhaka will be relocated to the new industrial zone and it is expected to provide employment to 18,000 workers including 1,800 women. More than 360 plastic factories will be commissioned in the 370 plots of the zone (Daily Asian Age, 2017). At the same time, Akij Group plans to invest $1.8 billion to set up three industrial plants in its economic zone in Mymensingh to produce raw materials for plastics which will cut imports (The Daily Star, 2016).

Eco-system development: The import of mold is costly and increases the lead time of manufacturing process which requires to be customized based on demand. Even a few years earlier, Bangladesh used to be 100 percent import-

dependent for molds, dices, equipment, and machinery. Fortunately, the local production of molds, dice and small machinery have started and increasing gradually. Enterprises like Walton, RFL are meeting one-third of their mold and dice demand through in house production. Local light engineering vendors have also learned to make molds and dices to support the industry informally. Such expertise can also be incorporated in the mold and dice making factories as backward support.

In addition, Bengal Group has introduced hygienic plastic pallets in Bangladesh, which are used to package industrial raw materials and move goods from one location to another. Plastic pallets used to be 100 percent import driven but the local manufacturing the pallets will open up a new range of opportunity for the plastics industry (The Independent BD, 2018). The pallets are ideal for highly regulated, hygiene-sensitive industries like pharmaceuticals, food products and manufacturing of RMG related products.

China's shift in interest: China used to be the prime plastic manufacturing country in the world. But as China reduces its focus on low value-added manufacturing and attempts to restructure toward a service-based economy (Forbes, 2017), there is a massive opportunity for Bangladeshi exporters to increase their global market share. Furthermore, China is considering shutting down its toy industry as it is becoming a less profitable and comparatively smaller industry. Bangladeshi entrepreneurs can team up with Chinese toymakers and launch a special economic zone for toys. China has been exporting toys worth billions of dollars from "Chenghai toy city". Such toy manufacturing hub will allow all toy manufacturers to work together and support the boost the sector. In the absence of a separate manufacturing hub and other facilities, the local toymakers find it difficult to explore the export markets and other inter-country opportunities.

3.11.8 Key challenges hindering growth potential

Import dependency: The raw material of plastic is imported to the extent of 100 percent from abroad. The price of raw materials has increased by $200 to $300 per ton in the international market which is hindering the growth of plastic production in the country (The Daily Star, 2016). However, through proper plastic recycling process similar to BPCL and waste concern, the dependency can be decreased gradually. Bangladesh produces around 381 tons of plastic waste every day, out of which around 30 percent can be recycled to produce plastic goods once again.

Restriction on importing recycled plastic as raw material: Bangladesh import policy restricts importing recycled plastic as raw material for manufacturing of plastic products. Countries like the US, Germany, India and many more imports plastic waste to process further and manufacture plastic products which reduce the manufacturing cost by 50 percent. Until 2017, China imported 51 percent of all plastic waste traded globally.

Compliance issue to export toy in the EU: The export of toys, games and sports requisites from Bangladesh is increasing rapidly. However, the major challenges of exporting toy items are safety, compliance and patent issues. In EU countries, toy safety is governed by TSD who obliges manufacturers, importers, and suppliers to ensure required safety and regulations. Each toy item goes through a prior assessment before entering into the market. Hence, not having adequate compliance in the toy manufacturing industry Bangladesh is facing challenges to export in EU countries.

Technical know-how and lack of testing lab: The plastic industry lags behind in terms of efficiency and productivity-related indicators. Lack of proper knowledge of polymer science is a hindrance for developing skilled professionals in the plastic industry. Local educational institutes have limited capacity to teach and train potential professionals to support the sector extensively. At the same time, there is also a lack of testing laboratory for quality assurance of manufactured plastic products which creates compliance issues in the export market.

Renewable energy & energy efficiency

Domestic Market Size	Export	Employment	2023 Market Size
USD 512 M	N/A	0.0001 M	USD 3.7 B

3.12 Renewable energy and energy efficiency

Bangladesh energy sector has seen strong growth in recent years driven by fast economic growth, rapid urbanization, and steady industrialization. Energy consumption has increased at six percent CAGR (2010-17) compared with the global average of 1.6 percent (Somesh Kumar, Sunnyside Up: Scaling up solar photovoltaics in Bangladesh, 2019). The government achieved success in steady generation as 93 percent of the population has access to electricity. Today, approximately 82 percent of Bangladesh' population is connected to the national grid and the other 10 percent depends on off-grid solutions[44]. Bangladesh joined the Climate Vulnerable Forum in 2016, aiming to meet 100 percent domestic renewable energy needs as rapidly as possible. However, the sector has been facing implementation constraints, as a result, Grid-tied plants build up lags behind expectations. On top, around 50 projects are in the pipeline that are running relatively high prices (0.12 to 0.17 $/kWh). Constraints on why projects take so long not fully understood but our key informants frequently cited about problems in land acquisition, lack of sector-specific data, inadequate land-use policy and financing as the key challenges. Adequate policy reforms are necessary for large scale renewable proliferation in Bangladesh.

3.12.1 Structure of the sector and analysis framework

The country is currently generating around 577.3 MW of electricity from renewables, which is just 2.79 percent[45] of total power generation. A detailed breakdown of the renewable energy mix is given in figure 2. Solar PV contributes 1.65 percent (338 MW) of the total power supply mixture, where off-grid Solar Home System captured the significant portion. Grid-tied Solar PV is approximately 42 MW where utility-scale solar park and rooftop have 45 percent and 55 percent share respectively. 650 KW is generating from a mini-grid project and approximately three to seven MW is coming from other sources such as solar irrigation, public lighting and water pumping telecom towers. Hydro wind and biofuel are 100 percent owned by public utilities as of now. Biofuel is on the process of deregulating by the government as the policy has been drafted for a commercial biogas plant for the private sector.

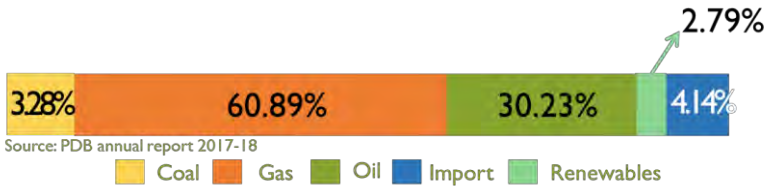


Figure 39: Renewable energy in total energy supply mixture

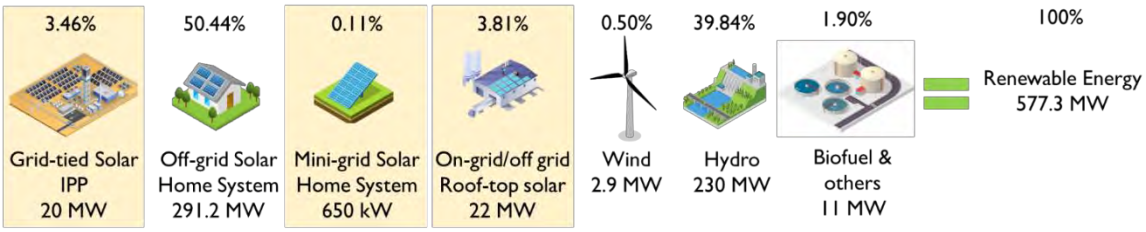


Figure 40: Sources of renewable energy in Bangladesh

According to the updated year-wise plan from renewables in 2017-21, the target has been set to increase the renewable energy generation capacity to 2458 MW by that time. Almost half (1,270 MW, 52 percent) is expected to come from solar power. Wind, which is currently at an experimental stage, is expected to contribute 1,150 MW (47 percent) by 2021. The rest is to come from biomass, biogas and small hydro (Jari Vayrynen, 2018). To meet the overwhelming target, the sector needs a sky-high growth rate (CAGR) of **634.68 percent and 55.46 percent** in wind and solar

[44] Retrieved from http://www.powercell.gov.bd/site/page/d730f98d-8912-47a2-8a35-382c4935eddc/- last visited on April 18, 2019.

[45] The calculation is based on the total installed capacity of 20,430 MW retrieved from http://www.powercell.gov.bd/site/view/powerdiv_achievement_at_glance/- last accessed in May 8, 2019

power generation respectively. To exploit this potential market there is an acute missed out investment vacuum to be filled by the private sector of the country.

Although the report has followed a 5S model for assessing the private sectors, the renewable energy sector of Bangladesh is still in its nascent stage which is yet to generate quantifiable assessment criteria like employment size and export value. As a result, to construct the report of the Renewable energy a set of guiding questions were followed to understand the following private sector dynamics across the renewable energy verticals (Solar, Wind, Waste to Energy and Cross border power trade).

- Perception and attitude towards renewable verticals as a business SBU.
- Perceived bottlenecks and challenges to pursue renewable verticals like a business SBU.
- Appetite for investment (short-term and long-term).
- Awareness about recent technical/technological developments.

3.12.2 Chapter 1: Wind energy

3.12.2.1 Status quo of the private sector in utility-scale wind projects

Wind energy in Bangladesh is still at the experimental phase, and our assessment reveals that there is a general lack of effort in resource mapping. Currently, wind contributes 0.5 percent in the renewable energy mix with an installed capacity of 2.9 MW where three plants are operated by public utilities. Few small-scale wind projects have installed by various government bodies and NGOs at various other locations spread across the coastal region[46].

Private sector interest in the grid-tied wind is relatively low till now as only two IPPs have submitted proposal and no PPA has been signed yet. Joules Power Limited in association with Siemens Gamesa is planning to establish a 10 MW utility-scale wind power plant at Feni, Sonagazi. The consortium submitted EOI to the State-owned Electricity Generation Company of Bangladesh (EGCB) in February 2019. Five wind turbines each with a capacity of two MW will be supplying a total of 10 MW of electricity to the grid.

Another 30 MW wind turbine power plant will be set up by a consortium of Indian companies (Bangwati Products Ltd, Regen Powertech Private Ltd, and Siddhant Wind Energy Pvt Ltd). The proposal was approved in 2019 by the prime minister and has been sent for the approval of the government's purchase committee. As per the negotiation, Bangladesh Power Development Board (BPDB) will purchase electricity under *build own operate* (BOO) basis. A total of 15 windmills will be placed, each of which will be producing two MW electricity.

3.12.2.2 What are the perceived challenges deterring private sector engagement?

Last 15 years, few attempts were made to measure and analyze the primary wind resource data to project the potential wind energy in Bangladesh. However, the attempts were intended for weather forecast (typically measured at five to 10m), therefore these were insufficient to estimate wind energy potential in line with modern wind turbine and technologies. Recently, the National renewable energy laboratory (NREL) in partnership with USAID published a report on the outcome of long-term wind speed data measurement at nine different locations of Bangladesh. However, to confidently calculate annual energy yield from each wind turbine, at least site-specific hourly data is required (SREPGen project, UNDP, 2018).

Project development challenges in wind energy are another major constraint behind low private sector engagement. Traditional financiers (Banks and NBFIs) consider this as a high-risk sector for financing. As a result, there is low access to credit line for the private sector in wind plants from multilateral and development banks. Wind turbines and rotor installation need high skilled technical manpower and improved road and waterway connectivity. Private sector players seek strong support from government considering the complexity of wind projects in remote locations.

3.12.3 Chapter 2: Solar PV

3.12.3.1 Status quo of the private sector in Utility-scale solar projects

Solar PV holds 57.82 percent share in the renewable energy mix which is significantly driven by the off-grid solar home system. Utility-scale solar projects are the place where the private sector is slowly penetrating holds only 3.46 percent. Since 2012, grid-tied solar parks have been attracting private sector interest but only one IPP (20 MW) succeeded out of

[46] Project list are given in the annexure

13 who signed PPA to build solar parks in different locations of Bangladesh. Joules Power Ltd. operates (commissioned in 2018) in Cox's Bazar district with an installed capacity of 20 MW. The market has gained momentum as Joules Power recently signed a MoU with Bangladesh Economic Zone Authority (BEZA) to develop a 1.6 GW solar hub in Chandpur economic zone. Moreover, government-issued 23 LOIs to IPPs for establishing solar park with an aggregated capacity of 1,470 MW, although there is no mentionable progress of these projects. Government is promoting rooftop solar across the country under the purview of a recently published net metering policy[47] - which has been widely accepted by the private sector, especially large industries as it allows them to install solar setups on their industry shed's roof and sell additional solar electricity to the government. Already close to 30 companies and many household owners installed a roof-top solar system which has a total installed capacity around approximately 11 MW.

3.12.3.2 What are the perceived challenges deterring private sector engagement?

Land acquisition is the biggest challenge for the private sector in the grid-tied solar park. Project Opportunity Areas (POA) which has high-quality solar resources is widely available in the northern part of the country but 99 percent of the POA land is primarily cropland (Kenji Shiraishia, 2019). As a result, investors are losing confidence which affects the IPPs to get appropriate financing for project implementation. Low annual solar irradiance compared to neighboring countries, absence of smart grid, and lack of appropriate incentives are remaining major constraint for private sector engagement in solar PV.

3.12.3.3 What kind of opportunities or technologies is attracting private sector investment?

The grid-tied solar park, solar roof-top and floating solar will attract more private sector investment compared to government/institutional funded Solar Home System. The potential market for renewable energy will be sized at $3.7 billion by 2023 and solar PV will contribute more than 50 percent of the market share. The current contribution of renewable will be two-folded by 2021, as eight IPPs are implementing grid-tied solar with an aggregated installed capacity of 550 MW. Except for a few of these, most of the projects will start functioning in the next few years. Dual-purpose land usage policy can boost the market. Annual generation potential of solar PV POA with six hours storage is 8.4-84 TWh/year but this estimation is dependent on the land use policy reformation as the POA of solar PV completely overlapped with cropland.

IDCOL[48] currently has 35 industrial rooftop projects in its pipeline with a cumulative capacity of 34 MW and intends to finance solar rooftop projects to generate a total of 1,000 MW electricity. The World Bank has approved $185 million to help mobilize up to $212 million from the private sector, commercial banks and other sources of financing and establish a dedicated Renewable Energy Financing Facility to provide credit to developers of rooftop solar photovoltaic (PV) along with other large-scale renewables (World Bank, 2019).

Dynamic Green Energy Ltd is ready to start work on floating solar on a 10 km² section of the Padma river in Manikganj district. The project's production capacity is yet to be fixed after completing a feasibility study, adding the company is waiting to sign a deal with the nation's ministry of land for the plant (PV Magazine, 2019). Interest was also found in a leading Solar IPP company (Joules Power Ltd.) as they are exchanging terms with Water Development Board to explore the water bodies of the country for setting up floating solar plants.

Bangladesh-based off-grid solar energy firm SOLshare has developed the world's first P2P solar electricity trading platform for off-grid households—making affordable, clean energy accessible to everyone. The company has raised $1.66 million to increase access to clean energy for over 19,000 rural households and 14,000 micro-entrepreneurs (Dhaka Tribune, 2018). The investors are Singapore-based IIX Growth Fund, Silicon Valley-based, New Ventures LLC –the venture capital investment arm of the German utility firm SE and Portuguese utility firm EDP.

3.12.4 Chapter 3: Waste to Energy (WTE)

3.12.4.1 Status quo of the private sector in waste to energy plants

Waste to energy in Bangladesh is in planning phase as BPDB took initiative to build two plants with an installed capacity of six MW in Keraniganj and Narayanganj. But the government revoked the initiative to implement on public utilities as they did not find any suitable bidder. Therefore, the government is now seeking private sector engagement to execute

[47] Net metering is a billing mechanism that credits solar energy system owners for the electricity they add to the grid.

[48] IDCOL (Infrastructure Development Company Limited) is a government owned non-bank financial institution that finances renewable infrastructure projects in Bangladesh

under Independent Power Producer (IPP) mode. Few more plants are under planning stage as five more city corporation will sign MoU with BPDB.

3.12.4.2 What are the perceived challenges deterring private sector engagement?

Waste to energy in Bangladesh is in planning phase as BPDB took initiative to build two plants with an installed capacity of six MW in Keraniganj and Narayanganj. But the government revoked the initiative to implement on public utilities as they did not find any suitable bidder. Therefore, the government is now seeking private sector engagement to execute under Independent Power Producer (IPP) mode. Few more plants are under planning stage as five more city corporation will sign MoU with BPDB.

3.12.5 Chapter 4: Cross-border power trade-potential market opens for private sector

Cross border power trade between Bangladesh and India started few years back which is 4.14 percent of the total energy mixture. However, the power trade was done only through public utilities. Recently Indian government amended their power trade policy named "Guidelines for import/export (cross border) of electricity 2018" which creates opportunity for Bangladeshi firms' to go for tripartite agreement and import or export energy from India and Nepal. In addition, to meet the renewable energy dearth, Bangladesh can import low-cost solar energy from India as several Indian states have higher potentiality of producing solar energy at a lower cost than Bangladesh.

3.12.6 Chapter 5: Energy efficiency-yet to deregulate for private sector

Bangladesh has potential in end-use energy efficiency gains including industrial, residential appliance and commercial buildings/service has around 50 percent energy-saving potential where industrial and residential buildings have around 30 percent energy saving potential by adopting Energy Efficiency and Conservation interventions (EY and IDCOL, 2019). Currently, the market is concentrated in the industrial sector as a few RMG factories have adopted energy-efficient infrastructure to ensure compliance standard. SREDA drafted regulation for Appliance standards and labelling 2018, ministry of housing and public works drafted Building Energy and Environment Rating for Design and Construction of buildings. These policies and regulations will be crucial to unlock the market in full potential. According to IFC, Bangladesh's estimated climate-smart investment potential between the period of 2018 and 2030 is about $172 billion whereas Industrial sector has $2 billion and residential green building sector has around $118 billion investment opportunity (IFC, 2019).

The manufacturing sector investment opportunity with total energy saving potential are listed below,

Table 11: Energy efficiency potential in manufacturing

	RMG	Textile	Cement	Glass	Pulp and Paper	Chemical	Steel re-rolling	Plastic
EE investment potential (in BDT)	88,534	46,540	24,050	4,350	15.03	10.75	3,773	0.928
Energy saving potential	32%	32%	23%	24%	24%	24%	41%	24%

Shipbuilding

Domestic Market Size	Export	Employment	2023 Market Size
USD 2.2 B	USD 30.35 M	0.15 M	USD 6 B

3.13 Shipbuilding

With a long coastal line of 120km and about 700 rivers including tributaries, Bangladesh is known as the largest Delta of the world. This makes the country one of the best destinations for building and repairing ships on the edge of the Indian Ocean. Despite having 200 years old history in shipbuilding, Bangladesh has entered the export market in 2005 when Ananda shipyard secured her first order to build international standard ship and delivered in the first half of 2008. With this turning point, numerous shipyards intended to start from scratch, and others enhanced their capabilities in order to become fully-fledged world-class shipyard.

3.13.1 Structure of the sector

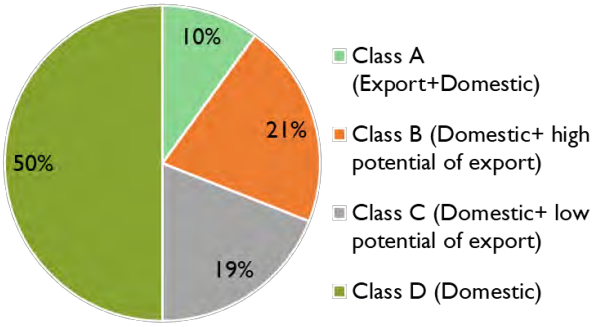


Figure 41: Structure of the shipyards in Bangladesh

In Bangladesh, there are over 125 shipyards at various regions across the country where 70 percent of the shipyards are in Dhaka and Narayanganj, 20 percent are in Chattogram, and the rest of the shipyards are in Khulna and Barishal division (K. Shahriar Iqbal, 2010). Shipyards can be categorized into four classes: Class A, Class B, Class C and Class D. Fifty percent of the shipyards are Class D where they build inland vessels, passenger ships and dredger for domestic market. The raw materials are sourced domestically including plate, frame, stiffener, longitudinal, and old generator from local shipbreaking yards. On the other hand, only 10 percent (Class-A) of the shipyards can make international standard vessels and their raw materials are highly import-dependent. Twenty-one percent shipyards need small expansion and renovation and 19 percent need major renovation to produce international standard. Western Marine is currently leading the market as they hold 89 percent of the export value till date.

3.13.2 Statistics: domestic market

Currently, the domestic market is valued at around $2.14 billion and increasing every year. Bangladesh has a long heritage of making tug boat and fishing trawlers for domestic purposes. Besides, passenger ships for local use, Ro-Ro ferries, and oil tankers are also being built in the existing shipyards. In addition, several industrial conglomerates including Meghna group, City Group, Bashundhara Group are making transport vessel to carry cargo from their factories to business units. LPG importers are also building transport vessels used in domestic distribution network. Government is also building 112 dredgers and dredging vessel costing $500 million for internal development work. Recently, the government has prioritized Capital River dredging for improving the efficiency of the current waterways of the country.

In Bangladesh, all internal transportation of imported goods is done through waterways especially lighterage vessels unload goods from deep-sea in Chattogram port. As a result, light transport vessels have high demand in the domestic market. In 2013, more than 2,500 cargo ships moored at deep-sea in Chattogram port which has increased by 48 percent within five years. This clearly indicates that lighterage vessels have a growing demand due to increased import and inland transport.

3.13.3 Statistics: export market

Bangladesh exported 43 ships till date sized at approximately $170 million. However, the CAGR remained negative 5.9 percent in the last seven years. During the European debt crisis and global economic recession, orders worth $2 billion were canceled by the European buyers. Due to this cancellation, the growing industry experienced a sharp downward trend in its export market; export earnings in FY 2013-14 and FY 2014-15 stood at only $5.73 million and $440,000

respectively. From mid-2015, the demand from both domestic and international markets increased giving the shipbuilders new life.

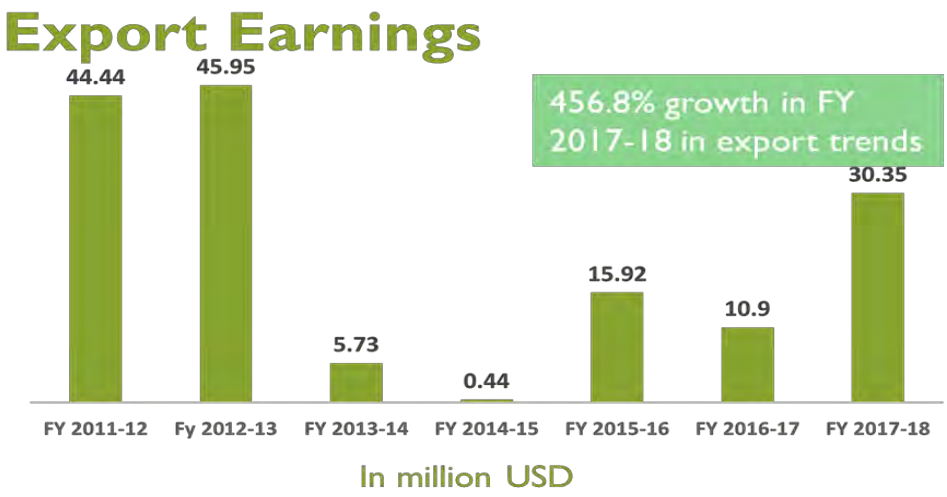


Figure 42: Value of ship export in seven years

With 456.8 percent growth in FY 2017-18 in export trends, Bangladeshi ships yards are expecting to capture the global medium and small-sized ocean-faring vessel market in the coming years. The global market sized at $400 billion and Bangladeshi shipyards are expected to grab one percent of the market which stood $4 billion.

The industry has immense potential in significant amount to earning from both domestic and export market however being a capital-intensive industry the situation is not expected to improve very soon. Domestic market fetched due to growing demand, but the export earnings still hovering around two-digit figure. Based on the evidence, insight and extrapolation from the key informant interview the industry is expected to be stood at $6 billion by 2023.

3.13.4 Support available for shipbuilding

3.13.4.1 Fiscal

- 10 percent cash incentive on export.

3.13.4.2 Non-fiscal

Government has been giving priorities to the shipbuilding industry in several policies. Shipbuilding was announced as a specialized industry for export diversification in recent Export Policy 2018-21. This industry has been declared as the "thrust sector" by BIDA due to its potential in the export business. Moreover, to encourage the shipbuilders to build ocean-going fishing trawlers, government has committed to ensuring refinancing scheme. According to BIDA, total 30 shipbuilding companies have registered where 22 were local investment and seven were joint venture and one in 100 percent foreign-owned project. Total investment sized nearly $103 million.

3.13.5 Sustainability of the ecosystem

3.13.5.1 Employment

Since the 1970s, shipbuilding work started to move away from Europe towards low-cost countries in Asia, notably Korea along with China entering the market in the last decade. India, Indonesia, and Vietnam also entered the industry during the last decade. Later, the journey of this industry started in Bangladesh with huge cost advantage because of cheap labor. According to the Banglapedia, ships made in Bengal were cheaper and more durable, this was acknowledged by the British colonial rulers who were strong-minded to safeguard their shipbuilding in the United Kingdom. Around 150,000 people employed in the sector and the majority of them are an unskilled workforce. According to the study conducted by ILO, around 84.70 percent of the workforce is unskilled and according to labor force survey 2016-17 female participation is only three percent.

Skill for Employment Investment Programme (SEIP) is working to scale up training in six priority sectors including shipbuilding. The chief coordinator of the training program of Association of Export Oriented Shipbuilding Industries of

Bangladesh (AEOSIB), Mr. Habibur Rahman said a total of 7,328 individuals were enrolled and among them, 5,625 have been assessed. With a success rate of 88.53 percent, the program coordinators are now training second batch of students to support the industry. The core focus of the training elements are: welding, fabrication, electrical and navigation, machine tools operation, machinery installation, painting and piping.

3.13.5.2 Environment

Shipbuilding industry falls under '*Red*' category in availing *Environmental Clearance Certificate,* referring to highest negative effect on the environment. Fortunately, the top shipbuilders of the countries are maintaining high compliance with regards to environment safety. To clarify the facts on environment-friendly compliance issues, it is evident that shipbuilding and ship-breaking are completely two different industries. One breaks the ships to scraps, which could be detrimental to the environment if definite compliances are not met and the other builds new ones. Furthermore, the facilities inside shipyards are "asbestos-free". The market leader, Western Marine shipyard is a BV certified ISO 14001: 2004 ensuring the environment-related compliances.

3.13.6 SWOT (Challenges)

3.13.6.1 Export-oriented shipyards are highly depended on imported raw materials due to the absence of quality steel plates and other shipbuilding components

Export-oriented vessels require huge quantity of class plates which is the main raw material for building the ships' bodies. Bangladesh does not produce high-quality class plates thus shipyards are losing margin because of import dependency. Rahim Steel is the only company which is sourcing limited amount of class plates to build the export quality ships, however, the quantity sourced is insufficient. Moreover, all sorts of machinery such as main engine, pump, and generator are imported. Due to high import dependency and port congestion, the delivery lead time is often considered as the biggest challenge to overcome. In case a company fails to deliver the ship on time, then it must count penalty.

3.13.6.2 Inadequate B2B marketing in the global market is hidden barrier for Bangladeshi Shipyards

Agile marketing and B2B branding of the industry among the foreign clients are currently absent in Bangladesh market. Attending fairs and events to showcase the caliber of the sector can help the country's dockyards to grab more market share.

3.13.6.3 Lack of technical expertise in R&D

The local shipyards suffer from a dearth of research and development (R&D), which ultimately fail to bring about any innovation and technological development for price competitiveness in international ship markets. At present Bangladesh is not working in the field of ship design, though skilled manpower is available (in limited number). As a result, lack of adequate and expert design firms and expertise in design are an impediment for high value-added product. Moreover, most of the local shipyards are lacking of modern shipbuilding tools, machinery and technology.

A big portion of the cost involved in a ship is actual design making of the ship. There are two types of design: basic design and advance engineering drawing. Bangladesh is lagging in advanced engineering as our education system does not produce enough designers and naval architects. Basic drawing often provided by the buyer- for a light vessel it requires 150 drawings, but high-end ships require more than 650 drawings. The country also lags in designing mode testing due to lack of testing lab facility.

3.13.6.4 Lack of access to finance is the biggest constraints for Bangladeshi shipyards to grow

Shipbuilding is capital- and labor-intensive industry. The local commercial banks are not individually capable of making required investment in this industry. Besides, consortium financing is time-consuming and a complex process, which is not so favorable for making investment in this sector. There is no standard framework for forming consortium and as a result, when a shipbuilding contract is obtained, the time lag of securing finance by forming consortium kills the contract. There is a dearth of capital and investment especially when the scale of investment is to the tune of 100 to 1,000 crore or more because of the risk is considered too high for both the entrepreneurs and bankers. As a result, productivity expansion and export promotion are being impeded

Shipyards in Bangladesh must bear high-interest rate of 14-16 percent (Bank interest over three to six percent Bank Guarantee over eight to 10 percent L/C commission over four to eight percent others charges one percent) in securing loan for covering initial ship making cost. These interest rates are extremely high compared to peer countries such as

Vietnam, India, and Japan. India has below 10 percent interest rate and 30 percent cash incentive for the shipbuilding industry. China, even after four decades of growth and maturity in this sector, provides single-digit interest rate for the ship makers.

Shrimp & fish

Market Size	Export	Employment	2023 Market Size
USD 370 M	USD 431 M	0.85 M	USD 1.3 B

3.14 Shrimp and fish

To consider increased outward orientation, the lens of analysis for shrimp and fish sector in this report is focused on the export-oriented segments including shrimp and few other emerging products: mud crab, seaweed and fish fillet.

Bangladesh has exported $532.03 million worth of fish and fishery products during FY 2016-17, almost 90 percent of which was contributed by shrimp only (Department of Fisheries, Bangladesh, 2017). Despite being eighth among the top 10 *brackish water* shrimp exporting countries, Bangladesh could export only 2.8 percent of the global shrimp export market (World's Top Export, 2018). There are two major types of shrimp produced in the country, 44 percent of which is *Bagda (Penaeus monodon*/black tiger shrimp), 37 percent is *Golda* (*Macrobrachium rosenbergii*/giant freshwater prawn) and the rest are wild shrimp which is almost entirely consumed by the domestic market (Shrimp in Bangladesh, 2018). Although 90 percent of the total fish and fishery export is dominated by shrimp, the shrimp industry is hamstrung by consistently low prices, diseased seed, value chain inefficiencies, and shortages of quality raw materials and a lack of scientific culture. On a positive note, the country is also trying to tap into the export market of *mud crab*, *seaweed and fish fillet*. The export of mud crab has started at a moderately strong pace with export earnings of $36 million in FY 2018-19 (Prothom Alo, 2019). The seaweed farming is still at a nascent level with 75 percent of total production being harvested from wild sources. At the same time, the fish fillet processing plant is constrained by the requirement of high capital investment (barrier to entry) and lack of price competitiveness in the global market.

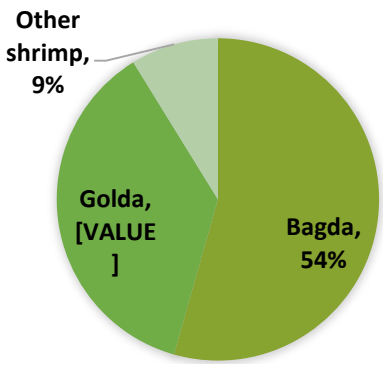
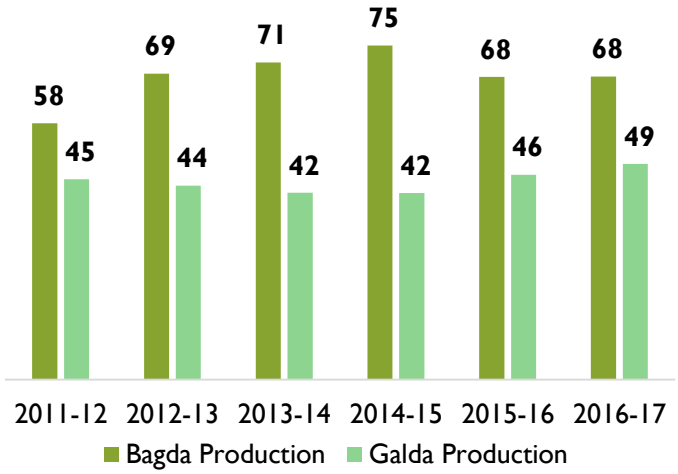


Figure 43: Percentage of shrimp production in Bangladesh

However, considering the future potential of the industry, with the impact of potential opportunities and minimize challenges, the industry is expected to earn $1.4 billion at the end of 2023 (Inspira extrapolation, 2019). In terms of the job multiplier effect of the industry, with a change in demand of $1 million the industry can generate 272 additional jobs.

3.14.1 Shrimp: present scenario of the market

More than 95 percent of shrimp and prawn in the country are produced in extensive polyculture ponds that were formerly used as rice ponds and are locally referred to as *'Ghers'*. Bangladesh has produced 68 million KG of farmed *Bagda* and 49 million KG of *Golda* in FY 2016-17 (Department of Fisheries, Bangladesh, 2017). However, the productivity per hectare is one of the lowest compared to neighboring countries. Whereas 75 percent of global consumption comprises of *Vannamei*, as of now Bangladesh does not have any footprint in the production of *vannamei* (Global Aquaculture Alliance, 2017).



The production yield of *Bagda* is 110-140 KG/acre and for Golda 270-290 KG/acre, in comparison, the production yield of *Vannamei* is 2,500-4,000 KG/acre. Due to high stocking densities of up to 150/m^2 in pond culture, and as high as 400/m^2 in controlled recirculated tank culture, *Vannamei* hold such high production yield. At the same time, *Vannamei* typically grows faster (1.5 g/week) with a 60-80 percent survival rate compared to *Bagda/Golda* growth rate (1 g/week) with a 20-30 percent survival rate only.

Bagda Yield: 110-140 kg/acre

Golda Yield: 270-290 kg/acre

***Vannamei* Yield: 2500-4000 kg per acre**

There are approximately 800,000 farmers directly involved in this sector, practicing only *extensive method* of farming.

Extensive farming usually refers to the fish farming conducted in medium to large-sized ponds or water bodies where the fish production relies merely on the natural productivity of the water which is only slightly or moderately enhanced. Among many other catalysts of lower shrimp production, one of the main issues is caused by the fact that farmers are entirely dependent on wild broodstock to produce post larvae. This wild broodstock often carries White Spot Syndrome Virus (WSSV) and other diseases which are passed onto farmers' ponds and end up infecting the entire pond ecosystem- thus limiting the production of shrimp.

3.14.2 Export market

The *brackish water* shrimp (*Vannamei* and *Bagda*) varieties contributed $17.4 billion in total global shrimp export of $19.3 billion during 2017 whereas Frozen freshwater shrimp/*Golda* generated only $1.8 billion in export sales in the same year (World's Top Export, 2018).

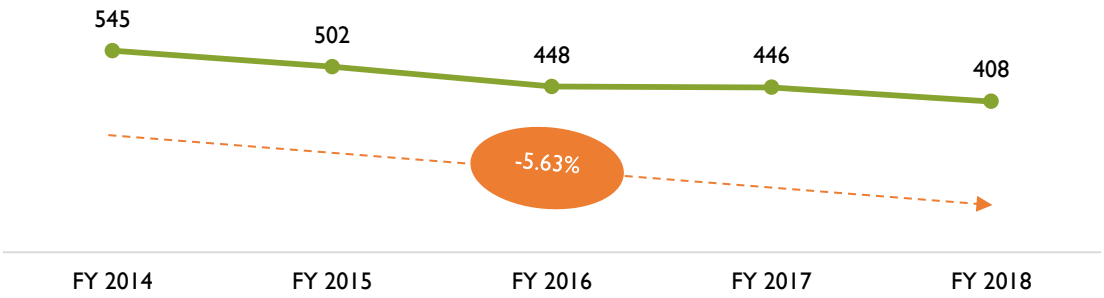


Figure 44: Bangladesh shrimp export, in million

Bangladesh has earned $408 million through exporting approximately 40 million KG shrimp (Bagda and Golda) during FY 2018 (The Daily Star, 2018). From $545 million in FY 2014, the export of shrimp has fallen for the fourth consecutive year to $408 million in FY 2018 (The Daily Star, 2018) exhibiting a negative CAGR of 5.63 percent. The low demand of local shrimp is caused by the comparatively higher price in the global market (due to higher production costs), diseased seed, and adulteration of shrimp along with a saturated global shrimp industry.

3.14.3 Domestic market

Despite a struggling export market, the local market in Bangladesh has emerged as a cushion for the country's shrimp farmers. With the growing middle and affluent classes in urban Bangladesh, this rising trend is likely to continue in the coming years. The domestic demand for *Golda* has evolved strongly and absorbs almost 75 percent of the country's annual production, resulting in local consumption of approximately 39 million KG per year (Department of Fisheries, Bangladesh, 2017). A total of approximately 63,000 tons[49] of shrimp (*Bagda, Golda and others)* are consumed in the domestic market, which if sold at a full and fair price, have the potential to generate a total of around $600 million[50] annually (Inspira Extrapolation, 2019). The bulk supply of shrimp comes from the main producing southern regions Khulna and Barisal, and goes to the country's largest urban consumer base (20 million) in Dhaka as well as to popular tourist destinations in Chattogram, Cox's Bazar, and Sylhet.

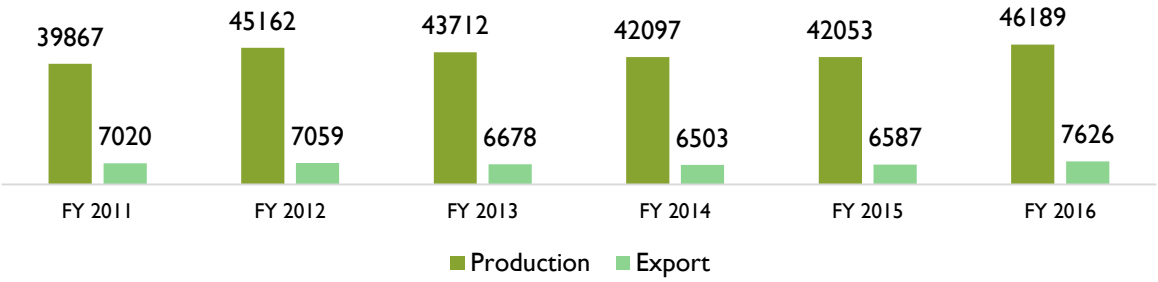


Figure 45: Yearly trend of freshwater golda production & export, in tonnes

[49] **Golda** ~35,000 tons (75 percent of total production), **Bagda** ~17,000 tons (25 percent of total production) and others/**Horina** ~11,000 tons (100 percent of total production) = ~63,000 tons (Seafood Trade Intelligence Portal , 2018)

[50] Considering an average price of $10/kg or BDT 800/kg

3.14.4 Challenges faced in the industry

3.14.4.1 Diseased seed

Disease has had a devastating impact on commercial shrimp farming in Bangladesh. Amongst all the causative agents, viruses proved to be the most serious due to heavy mortality of shrimp which collapsed the industry in many coastal areas of Bangladesh. Among all the viruses, the most common is white spot syndrome virus (WSSV) and studies show 30-80 percent of broodstock carry white spot disease, leading to only 10 to 20 percent pond survival (USDA Food for Progress and Winrock International, 2018). The shrimp hatcheries produce approximately 10 billion post larvae for shrimp farms during FY 2016-17 and almost all hatcheries use wild broodstock from the Bay of Bengal which are contaminated with microbial pathogens. There are only two Specific Pathogen Free (SPF) hatcheries producing 180 million post larvae, meeting only 1.8 percent of total demand (USDA Food for Progress and Winrock International, 2018). SPF shrimp are those that are maintained in highly biosecure facilities and have been routinely checked and found to be free of specified pathogens to ensure quality post larvae.

3.14.4.2 The traditional method of Farming

Bangladesh is lagging far behind in cultivating shrimp due to its use of traditional farming methods while competitors in the global market such as Vietnam, Thailand, and India are cultivating shrimp in accordance with newer scientific methods. At present approximately 95 percent of *Ghers*/ponds in Bangladesh follow the extensive/traditional farming method only (Department of Fisheries, Bangladesh, 2017). In the global phenomenon, the scientific method of shrimp production cost 20 times more than the traditional method, whereas it can provide almost 100 times more return (Food and Agriculture Organization of the United Nations, n.d.). To support the semi-intensive farming, SAFETI has introduced six steps of upgraded production technology which include: 1) use of healthy seed from SPF broodstock, 2) purifying pond water, 3) deepening of ponds, 4) better feed management, 5) increased biosecurity, and 6) healthy shrimp and water management (USDA Food for Progress and Winrock International, 2018).

Due to a lack of awareness, shortage of capital, and a history of viral epidemics, farmers do not feel encouraged to try scientific culture. The first trial of semi-intensive farming began in 1993 in the Cox's Bazar region and without a reservoir tank in the pond, the farmers stocked 10–35 post larvae (PL)/m^2 using supplemental pellet feed. This resulted in the first outbreak of a viral epidemic during 1994 which spread to other coastal districts affecting all extensive shrimp farms. A similar disease outbreak once again caused the collapse of shrimp production in both the Cox's Bazar and Khulna regions in 2001 (Food and Agriculture Organization of the United Nations, n.d.). There are, however, a few farmers in Cox's Bazar who cultivate shrimp in accordance with the scientific method and currently cultivating around 3,000 kg of shrimp on just a single acre of land, resulting in a yield approximately 15 times higher yield compared to traditional methods (The Independent, 2018).

To support the scientific farming method, adequate shrimp feed is also required. Among 61 feed mills, only 10 mills are exclusively producing fish and shrimp feeds (Bangladesh Frozen Food Exporter Association) and there are no mills exclusively working to make shrimp feed, resulting in import dependency of shrimp feed. Fish and shrimp feed usually have a poor shelf-life and feeds past their "shelf life," as well as those that are incorrectly stored, may contain toxic or anti-nutrient factors. Feeding fish or shrimp with old or contaminated feeds may result in abnormal behavior, poor feeding response and growth, and general loss of condition.

3.14.4.3 Inefficient value chain: Factory owners' lack of willingness to invest in backward linkage actors

The inefficient value chain is the core issue in the shrimp industry which contains various complicated layers and sublayers. There are five major layers such as 1) Input: Wild Catch, Hatcheries and Post larvae distribution, 2) Farming, 3) Trading: *Faria*/small-scale traders, *Aratdar*/Private auction place, Depots, *Paiker*/Wholesalers, 4) Processing 5) Export: Agents and Ports (Seafood Trade Intelligence Portal, 2018)

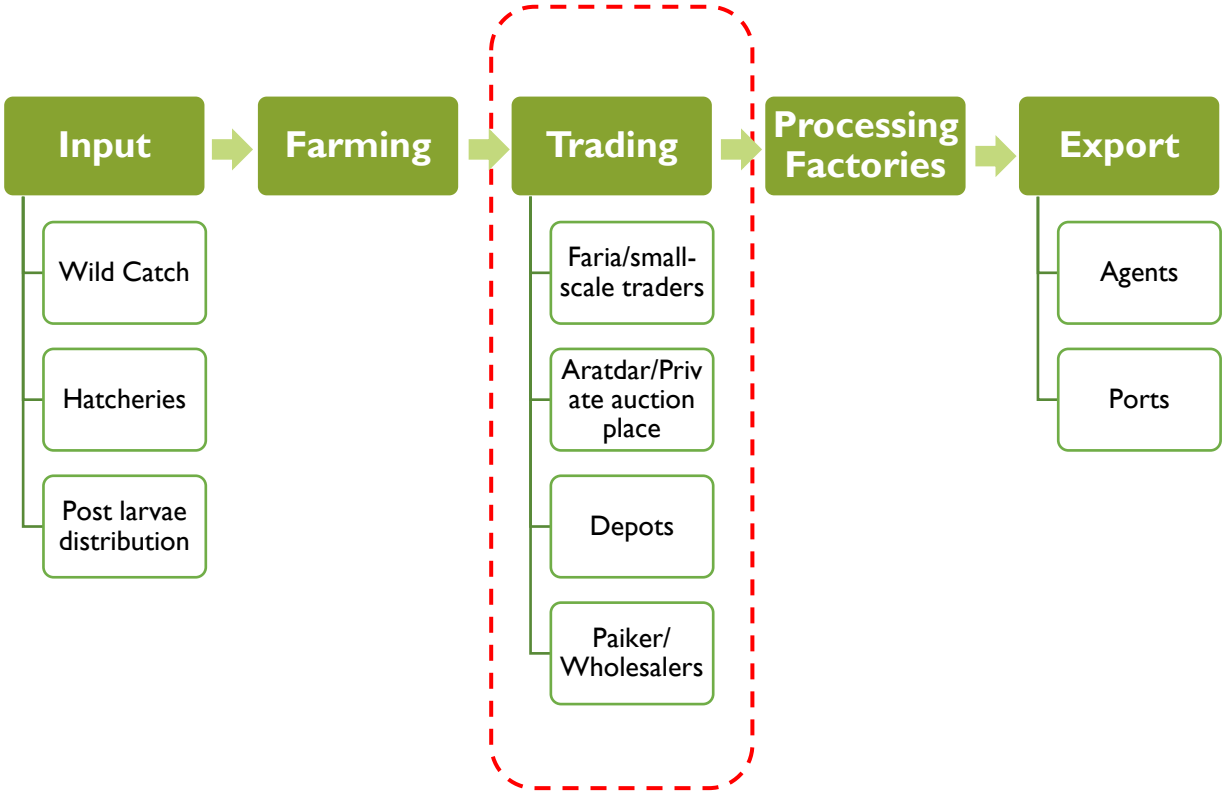


Figure 46: Inefficient value chain of Bangladesh shrimp industry

According to a report commissioned by WorldFish[51], the final actor of the value chain i.e. processing factory, usually buys the raw material (shrimps) on credit or providing maximum 40 percent of the payment. The remainder is paid only after the exporter receives payment from their overseas buyers. Sometimes the remainder is paid after the factories receive government announced cash incentives which further delays the payment lead time. For small scale value chain actors (early-stage actors who supply to the factories) this delay puts a lot of undue pressure and sufferings, curbing down their abilities to invest for incremental upgradation of their own setup. However, factories can already collect bank loans based on the letter of credits that are provided by their customers. Factory owners are often accused of using part of this money (that they are supposed to pay to their suppliers on time) for investments in other companies that operate under a holding company. It explains the unwillingness of factory owners to invest in the supply chain and an important constraint for supply chain simplification.

3.14.4.4 The decline of shrimp processing plants

Previously there were 104 export-oriented frozen food factories in the country but now only around 30 are running, while 64 factories have closed down completely, 10 are *sick*[52] and may close down anytime (The Independent, 2018). Among the remaining 30 fully running factories; 25 are located in Khulna and five in Chattogram. The current processing capacity of the factories in Bangladesh is 400 million KG but due to a shortage of raw material, only 135 million KG shrimp is processed (The Independent, 2018). Owing to the acute shortfall in shrimp production, nearly 80 percent capacity of factories remains unutilized. It is projected that unless there is a major paradigm shift in the system, the number of processing plants will keep decreasing gradually.

[51] study was commissioned by WorldFish as part of the Standards and Trade Development Facility (STDF) project, which is funded by the World Trade Organization (WTO) and implemented by the Food and Agricultural Organization (FAO) in partnership with WorldFish and the Department of Fisheries in Bangladesh

[52] Industrial sickness: An industrial company which has, at the end of any financial year accumulated losses equal to, or exceeding its entire net worth and has also suffered cash losses in such financial year and the financial year immediately preceding such financial year

3.14.5 Shrimp industry at crossroads: Looking at the horizon

Despite the present decline that the industry is going through, the implementation of the following dynamics might have a transformational impact for a better future.

Shrimp Technology: Boosting black tiger (*Bagda*)

Bangladesh's famous brand black tiger shrimp is a highly sought-after item in the European market due to free-range shrimp production where the shrimps are kept in as close as possible to natural conditions, and with freedom of movement. Over 80 percent of the total shrimp exported during 2017 was to the EU market, particularly to The Netherlands, Germany, and Belgium. The Netherlands is currently the EU's largest monodon (*Bagda*) importer, purchasing $89.82 million worth of shrimp from Bangladesh in 2017. Bangladesh and The Netherlands have signed an MoU in early 2019 with the plan to transfer knowledge and innovations for boosting black tiger shrimp (*Bagda*) production in Bangladesh. The production will be developed through mangrove integrated shrimp farming systems, high-tech shrimp cooking and freezing technology, and the latest developments in shrimp feed nutrition, feed management and shrimp genetics.

3.14.5.1 Vannamei initiative

The white-leg shrimp, often called Vannamei (*Litopanaeus vannamei*) is one of the most popular cultured shrimp species in the world due to its taste and size. *Vannamei* accounted for more than 70 percent of the total global export during 2017.

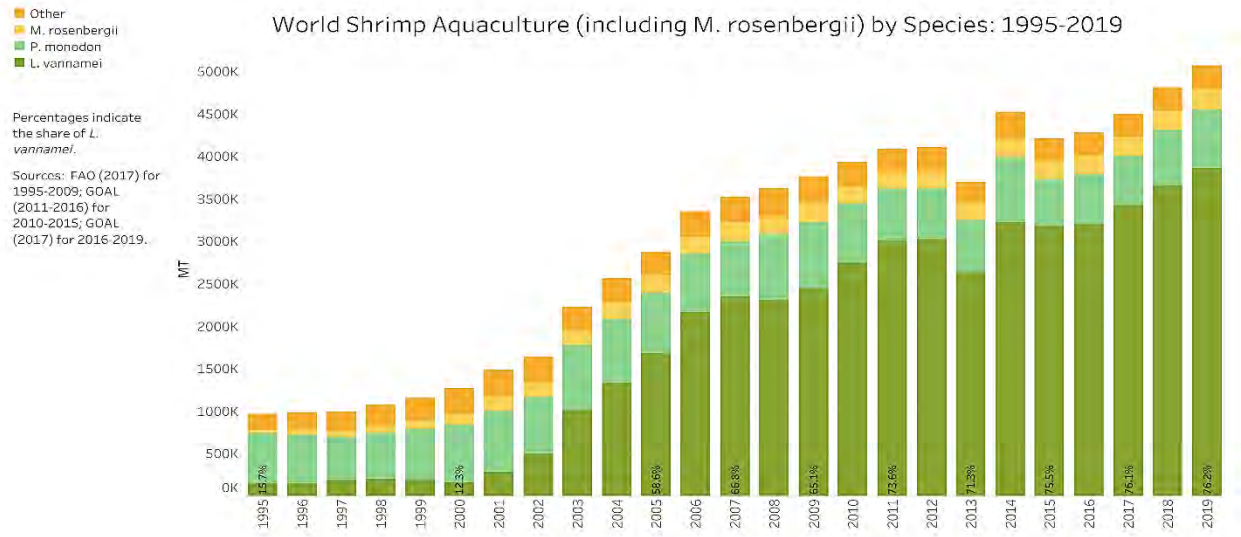


Figure 47: World shrimp aquaculture by species (1995 to 2019)

The government of Bangladesh did not allow trial of *vannamei* until 2018 due to a lack of required infrastructure and biosecurity measures as well as the virus outbreak from early 2000. However, in the face of demand from shrimp exporters, the government has shown positive signs in experimental cultivation of *vannamei*. Hence, a pilot project of three to four years will be tested with one to two hatcheries in isolated facilities in Khulna and Cox's Bazar. The commercial production will be considered only after a successful pilot project. The move was encouraged through intense competition faced by locally grown black tiger shrimp and prawn in the global export market from the cheaper and widely produced *vannamei*. The major exporters for Vannamei are Ecuador, Argentina, Vietnam, India, Thailand, and Indonesia. *Vannamei* accounts for approximately 100 percent of total shrimp exports in Ecuador, Argentina, and Thailand, while the other countries are also supplying Monodon shrimp (Centre for the Promotion of Imports from Developing Countries, 2018).

3.14.5.2 Export-oriented emerging products

Mud crab

Industry dynamics

Showing the fastest growth among the country's marine resources, mud crabs have become the second-most exported crustacean from Bangladesh. With an almost 90 percent year on year growth, the country has exported $36 million worth of mud crab during FY 2018-19 from $20.7 million export during FY 2017-18. (Prothom Alo, 2019). It is expected that with successful artificial crab cultivation in commercial level, the export market of crab will also increase significantly. There is a great demand for Bangladeshi crabs due to its taste, size, and variety. Among four types of crab products (i. Live Crab, ii. Frozen Crab, iii. Crab Meat and iv. Crab Legs) exported, 78 percent were live crabs and remaining were Crab Meat and Crab Legs (The Independent, 2018).

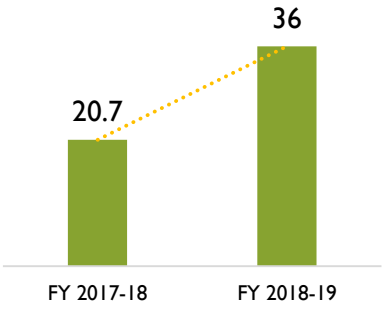


Figure 48: Export earnings from mud crab, in million

In southwest Bangladesh, mud crab farming has become an income-generating activity and with a relatively high price per unit, it is becoming more lucrative to farmers. mud crabs are less prone to disease compared to shrimp as well as less vulnerable to the local effects of climate change and the deterioration of water quality (World Bank 2014). Hence, many shrimp farmers are switching to mud crab farming in existing shrimp *gher/ponds*. Crabs are mainly being harvested in greater Khulna, Barisal, and Chattogram regions.

Private sector investment opportunity

Artificial crab cultivation: While the export from mud crab farming continues to increase, the major portion of mud crab export is wild-caught from tidal rivers, mangroves, and other coastal areas. This has an adverse impact on the Sundarbans eco-system and also causes supply uncertainty from over-harvesting. Globally, successful hatchery production at commercial scale has reduced the pressure on wild stock and increased the availability of seed stock to serve the growing demand. Bangladesh Fisheries Research Institute (BFRI) researchers have developed artificial reproduction methods for crabs, which is yet to be proven for commercial production. The variety that Bangladesh exports the most *Scylla Serrata Crab*, can be produced at hatcheries with this method of reproduction. (Prothom Alo, 2019). Such method of reproduction in the hatchery is a positive sign for private sector investors of Bangladesh for future business potential.

Crab feed: Since mud crab hatcheries are a new concept in Bangladesh, the rollout of the technology, feed management, and nurseries need to be well coordinated. An improved feed management system ensures the right health and growth of the crablets. However, the local farmers are using small marine fish and fish products that have little or no market value, also referred to as *trash fish,* as the major feed for the crablets. The current use of *trash fish* does not ensure adequate nursing or nutrition which results in disrupted growth of the crablets. Hence to ensure the right growth of the crablets, the establishment of suitable nursery operation and feed management companies to produce formulated diets has become necessary.

Besides, these two major issues, the private sector investors can invest in mud crab hatchery technology to establish efficient and viable transport system for crablets and develop efficient marketing means to tap the local and export markets.

Seaweed

The global seaweed market is worth $6 billion (FAO 2018); and considering food, pharmaceuticals, and cosmetics together, the seaweed industry generates more than $22.13 billion each year (GVR Research 2019). Seaweed is full of iron, iodine, different mineral salts, and carotene and it can provide additional nutrition to the elderly and children. Seaweed can also reduce the risk of heart disease, high blood pressure, and diabetes.

The country has harvested 80,000 KG of Seaweed in 2018. Among which only 25 percent were cultivated and 75 percent was collected from the natural source. Bangladesh is rich with 133 species of Seaweed and ten of them are commercially important species (DOF 2017). Even without the application industry, Bangladesh has approximately $170 million revenue potential in Seaweed market. Country's 480 km coastline and 25 million sq. mt. of coastal area with muddy beaches, estuaries and mangrove swamps can provide suitable habitat for various types of Seaweed cultivation.

Fish fillet

The global market for fillets stands at around $200 billion a year with an average price per unit $3.03. The market for *Pangasius* and *Tilapia* is rising due to the declining supply of marine catch and various regulations on sea fishing imposed by different countries. Since 2015, seven Bangladeshi firms have invested approximately $140 million to tap into the global fillet market. At present, only three fillet plants are running where the average capacity utilization of the factories is only 18 to 20 percent owing to lack of raw material sourcing. Moreover, the quality of the processed output (shape, size, color), skill of the workforce, state of technology, and machinery; all of these success-KPIs have not been satisfactory either which is eventually reducing Bangladesh's competitiveness in front of Vietnamese exporters. To address these challenges, the recent most entrants in this sector, such as Virgo Fish (operational since 2017), have started partnering up with foreign technical counterpart. Virgo has partnered with DANIDA and Danish Business Group for sourcing of machinery, skill development training of machine operators and QC officers.

Fillet industry has another crucial by-product which can be leveraged for higher revenue churn. Generally, one kg of fillet is obtained from three kg of fish and thus wasting 60 percent of fish body which is referred to as 'offal'. This offal can replace the fish meal and fish oil used in the feed industry, which is imported from Maldives, Brazil, Sri Lanka and Vietnam. Locally produced *fish meal* (sourced from offal) is sold at BDT 70 per kg while the imported one is sold at BDT 100-120 per kg. Similarly, *fish oil* used in the feed industry is also imported and sold at retail price of BDT 80-120 per kg while the local ones (sourced from offal) are sold at BDT 40 per kg. This indicates the cost arbitrage of offal which is to say fillet industry operators can also reap benefits by connecting as a backward linkage actor with $1.5 Billion domestic feed industry.

Telecommunication

Domestic Market Size	Export	Employment	2023 Market Size
USD 3.8 B	N/A	0.245 M	5.08 B

3.15 Telecommunication

As a mature sector with high investment flow, the lens of analysis for Telecommunications is focused on the verticals and their direct contribution to the economy. Hence in the sustainability part will only focus on the upcoming trends of the sector in line with Sustainable Development Goals (SDG)

Serving more than 85 million unique subscribers (in FY 2016-17), the Telecommunications sector in Bangladesh has crossed five decades of the journey and currently holds the title of "fifth largest mobile market" in Asia Pacific region (GSMA, 2018). Bangladesh is also the ninth-largest market in the world in terms of the unique subscriber. The ecosystem also provided employment to more than 760,000 people largely driven by direct employment creation which will grow nine percent in the years from 2016 to 2020. The sector is quite large in size and has a crucial contribution to achieving the goal of making Bangladesh a middle-income country. In FY 2016-17, the telecommunications sector contributed 6.98 percent of country's GDP amounted to around $29.6 billion (BBS, 2017-18).

3.15.1 Structure of the sector: Verticals of Bangladeshi telco

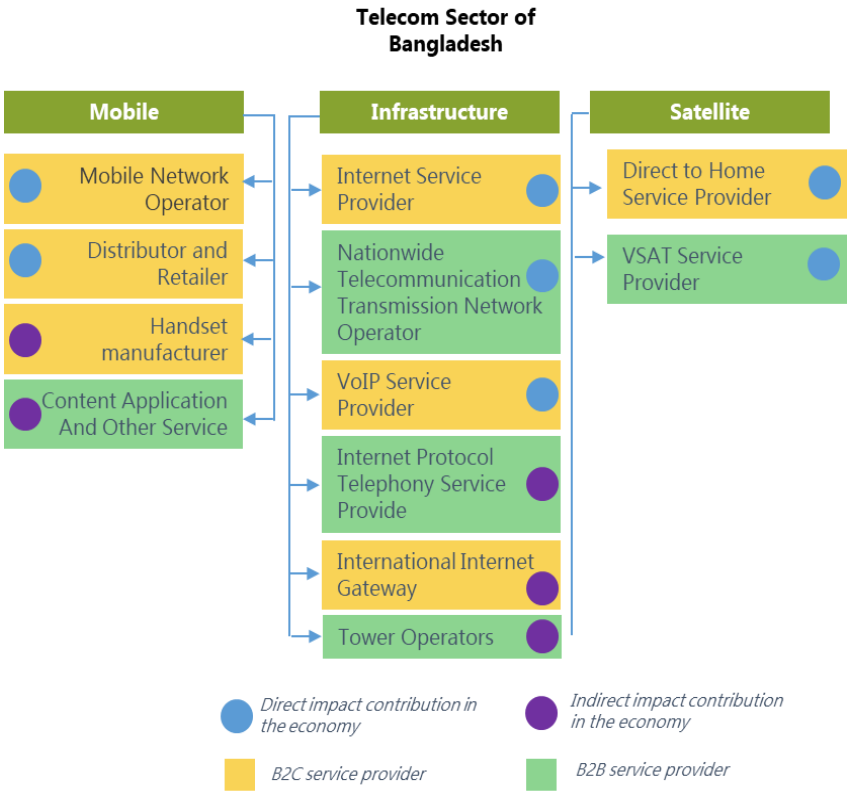


Figure 49: Telecom sector at a glance.

The telecommunications sector of Bangladesh can be categorized into three broad areas; Mobile, Infrastructure, and Satellite. Under this category, the firms provide a variety of services to consumers, government and businesses. Based on the nature of the services provided by the firms it can be divided into two sections; B2C and B2B service provider. B2C players dominate the market in the mobile category as they have a high direct contribution in the country's economy. Mobile Network Operators generate $27.5 billion of revenues in FY 2015-16 and listed top in the mobile category. Four operators are operating in the market where by Grameenphone is leading the market with 46 percent customer and more than half of the total revenue. In the infrastructure category, National Telecommunications Transmission Network (NTTN) operators are flourishing since they provide B2B infrastructure service to Mobile Network Operator and Government. Bangladesh has successfully launched its first commercial satellite recently, since then a new window has opened up direct-to-home service for the private sector.

3.15.2 Statistics: domestic market

The economic contribution of the telecommunications sector is highly driven by mobile operators with a direct impact contribution of 58 percent, followed by distributors and retailers directly contributes 25 percent and infrastructure providers 12 percent. On the other hand, the handset manufacturers contribute only one percent and content applications and other services hold four percent (GSMA, 2018).

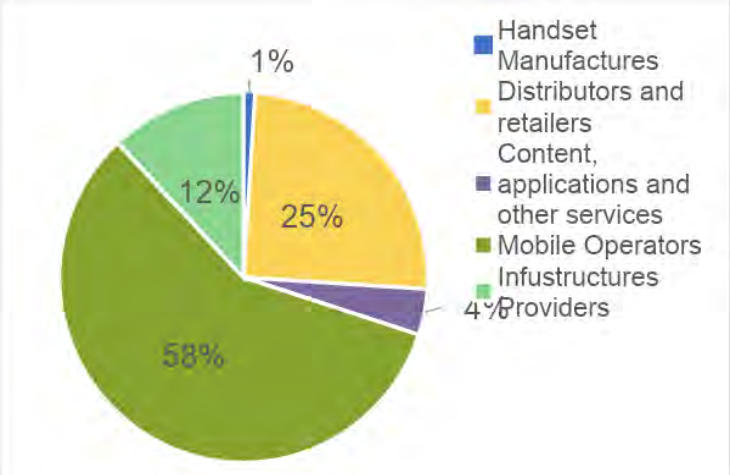


Figure 50: Economic contribution by sub-sectors

3.15.2.1 Transforming with G-leaps: the shift from voice to data

Bangladesh has a matured voice market which has achieved 94 percent teledensity till FY 2017-18 (BTRC, 2017-18). On the other hand, the digital industry is at a nascent phase as data penetration is still low compared to peer countries. With a predominant 2G mobile market, 71 percent of connections were 2G even at the end of 2017. 3G is expected to surpass 2G connections by 2020 reaching 46 percent of total connection which requires continued investment and network upgradation for mobile operators. However, over the next decade, a combination of improving affordability, greater network coverage and technology advances; the mobile internet penetration is forecasted to reach 41 percent by 2025, with 4G accounting for half of the total connections.

The CAGR of the unique mobile subscriber from 2017 to 2025 is three percent which indicates that the current figure of unique mobile subscribers expected to be 107 million in 2025 (GSMA Intelligence, 2018).

With the current 85 million unique mobile subscribers, the penetration rate is 51 percent. With the projected growth rate, in 2025, the unique mobile subscriber penetration rate will increase by nine percent which will make a unique mobile subscriber penetration rate approximately 60 percent (GSMA Intelligence, 2018).

A total number of sim connections are quite higher compared to a unique mobile subscriber. In 2017, a total of 145 million sim connection has been activated in Bangladesh. With the projection, the CAGR of total sim connection from 2017 to 2025 is three percent. By 2025, the total number of sim connection will be 190 million (GSMA Intelligence, 2018).

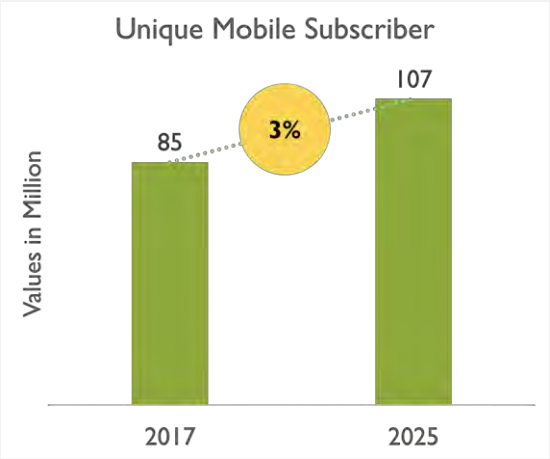


Figure 51: Mobile subscriber growth

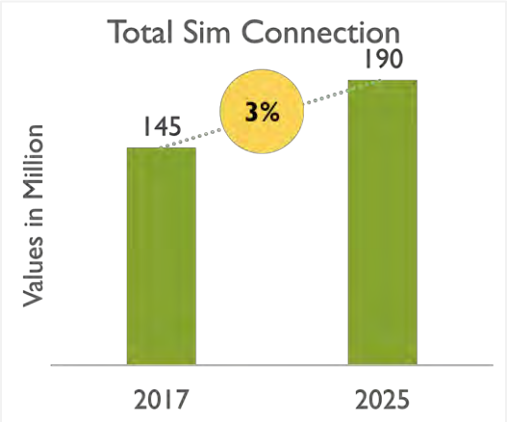


Figure 52: Sim penetration

Currently, the penetration rates of a total number of sim connections are 87 percent. By 2025, the penetration rate of a total number of sim connections will be 102 percent. However, while projection GSMA did not consider licensed cellular IoT[53] (GSMA Intelligence, 2018).
In the case of unique mobile internet subscribers, the current number of subscribers is 35 million. With 10 percent CAGR, the number will be 73 million within 2025 which double compare to present a number of subscribers (GSMA Intelligence, 2018).

The current unique mobile internet penetration rate is quite low around 21 percent. However, after launching 4G services in 2018, the growth rate in mobile internet penetration rate will be higher in the near future. According to projections, in 2025, the unique mobile internet penetration rate will be 41 percent (GSMA Intelligence, 2018).

Like mobile internet subscriber, in the year 2017, a total mobile broadband connection is only 29 percent. With the growing 3G/4G subscribers, it is expected that mobile internet subscriber will grow up to 82 percent within 2025 (GSMA Intelligence, 2018).

Bangladesh is one of the late adopters of 3G in South Asia and has adopted 4G after eight years of the global launch. One of the key reasons behind this late adoption was spectrum distribution among the MNOs. At the same time, the price of spectrum in the country is also quite high compared to other countries.

In 2017, the total number of smartphone users was 48 million. In 2025, the number will be three-folded and reach to 138 million. As the number of

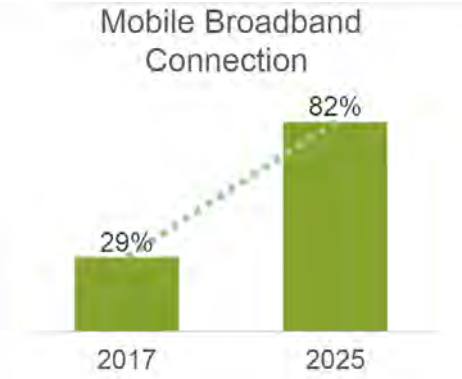


Figure 53: Broadband penetration

[53] Internet of Things

smartphones will grow up, the mobile broadband connection will grow accordingly (GSMA Intelligence, 2018).

Over the last decade, data-hungry customers with better smartphones, OTT[54] services, and digital lifestyle gears are ruling over the telecom industries throughout the world. On the other hand, the Average Revenue Per User **(ARPU)** is declining all over the world (Mckinsey and Company, 2018). Following the global trend, Bangladesh's MNOs are also losing their ARPU. In the last fiscal year, BTRC has lost the revenue of $17.56 million due to OTT phone calls by using mobile applications (News Today, 2019). Compared to Thailand, Malaysia, Sri Lanka, Cambodia, Laos, India, Nepal, Myanmar and Pakistan, Bangladesh has scored second lowest ARPU with $2.9 while India holds the last position. In such case when data took over voice, ICX, Voice Call section of MNO, PSTN, IGW loses business while NTTN, IIG, Data selling section of MNO, digital platform owners gain businesses.

Case study: OTT services in Bangladesh

Grameen Phone (GP), the largest MNO in Bangladesh, has launched a video streaming platform in 2016. Currently, on a monthly basis, the platform has three million subscribers. The platform has two segments, Prime comes with a paid subscription and another one is free. The operator also sells specific data packages to GP users to attract subscribers.

Robi Axiata Ltd., another MNO of Bangladesh has recently partnered up with "iflix" which is leading video on-demand service provider. Under the contract, Robi and Airtel users receive additional benefits in subscription fees and offers.

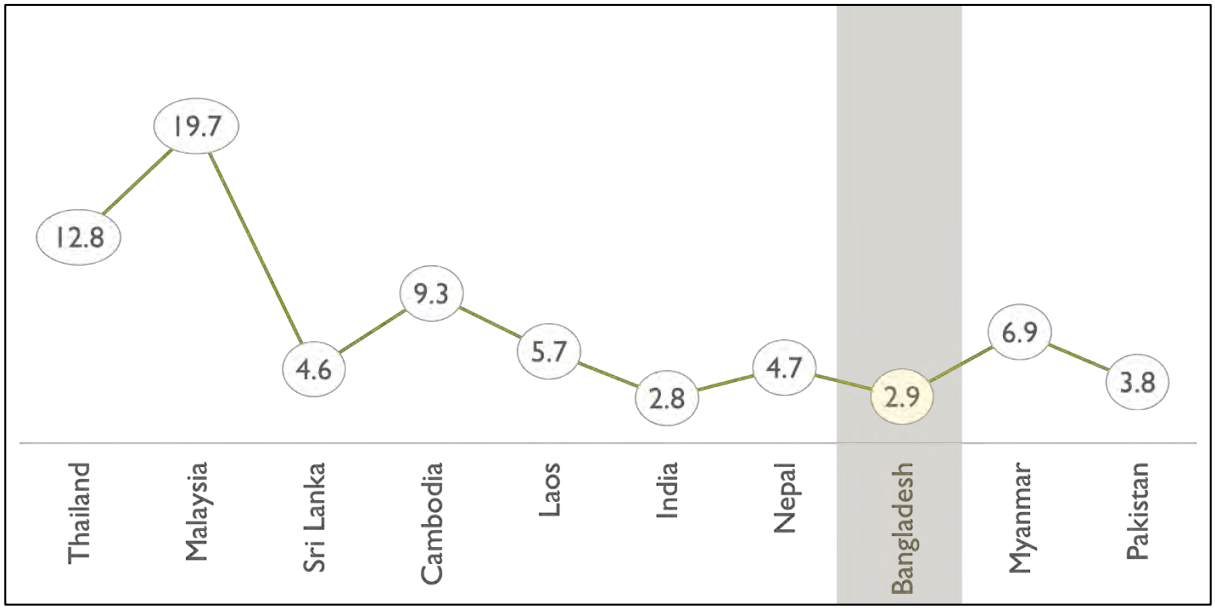


Figure 54: Cross country comparison of ARPU

3.15.3 Support: GoB vision, policy, infrastructure, investment

The telecom industry is highly regulated and taxable sector in Bangladesh. Publicly traded/ listed corporations are imposed with a 40 percent income tax while unlisted telecom operators are exposed to a 45 percent income tax, a much higher rate compared to any other industries. Moreover, the government imposed new tax burdens as operators have to pay BDT 100 ($1.19) for each new or replacement SIM. Besides, 5.5 percent of the revenue sharing of mobile operators with the government will remain unchanged up to 2033 (The Independents, 2018). Government approved the National Telecom Policy in 2016, which allows spectrum and service neutrality, a long-awaited need of the country's mobile operators (BTRC, 2017-18). It aims to achieve 100 percent teledensity and 65 percent of internet penetration by 2021. The policy also focuses to raise the broadband internet use to 60 percent and fiber optic cable connectivity to 50 percent by 2025.

[54] Over The Top

3.15.4 Sustainability: no poverty, reduce inequalities, affordable and clean energy, (SDG 1,7,10)

Before 2011, Bangladesh was a cash economy. In the last seven years, mobile money has done more to extend the reach of financial services than tradition banking channel in Bangladesh. Mobile network operators played a crucial role in expanding the mobile financial services market. Uptake and use of mobile money services can be increased by digitizing more payment streams which would benefit consumers, businesses and the government.

Birth registration acts as a key enabler for a multitude of development outcomes including access to healthcare, education and social protection ensuring reduced inequalities thereby supporting a number of UN Sustainable Development Goals. Mobile network operators have a big role to play in improving childbirth registration in Bangladesh. According to LGRD Birth and Death Registration database, Bangladesh has 87 percent birth registration rate but the rate within 45 days is below three percent. Bangladesh, the process of birth registration has been marred by a host of socioeconomic and cultural hindrances including time, cost, travel, processing complexities, and a general lack of awareness among the masses limiting registrations. A comprehensive mobile-based solution can help to achieve SDG 10 and give parents unprecedented access to birth registration of newborns and unregistered children of up to 18 years of age. Telenor Pakistan joined hands with UNICEF and local governments to develop an initiative to of birth registrations and the provision of unique identities to the most underserved (Global Village Space, 2018).

A green mobile tower to reduce environmental effect is another segment where mobile network operators can play an active role in helping achieve SDG 11 (affordable and clean energy). The vast majority of the Bangladeshi mobile phone operator's base stations, each of which include a tower and radio equipment attached to it, had backup diesel power which consumes two liters of diesel per hour and produces 2.63 kg of CO2 per liter. This consumption will increase as more operators expand their network further and launch 4G. This "dirty" non-environment friendly diesel generators in Bangladesh are being challenged by clean, renewable energy at the sites of mobile towers as solar-powered base transceiver station (BTS) is proven to be a possibility in the country. The Malaysia based *edotco* group which is an integrated telecommunications infrastructure service company providing end-to-end solutions in the tower services sector including co-locations, built-to-suit, energy, transmission, operations and maintenance (O&M) has already built over 300 solar-powered mobile towers in Bangladesh. The *edotco* group has acquired more than 9,000 mobile towers in the country and laid out the plan to integrated solar power in most of its towers over time. Tower sites that have solar panels are able to supply power up to 4.6 hours a day on average (depending on the amount of sunlight available), causing zero atmospheric pollution as well as zero noise pollution, which generators otherwise produce (Dhaka Tribune, 2016).

3.15.5 SWOT: The upcoming Telecom sector of Bangladesh

3.15.5.1 Bangabandhu Satellite-1: a stepping stone for Bangladesh in digital era

SpaceX, a US-based space company launched Bangladesh's the first commercial satellite on May 2018, and Bangladesh becomes a member of the exclusive club of satellite-owning countries. Bangabandhu Satellite-1 will help to flourish Direct to Home (DTH) service for TV channels, VSAT, network restoration, disaster preparedness, and relief. Association of Television Channel Owners (ATCO) has agreed to use Bangabandhu Satellite-1 from May 2019.

As of now, Bangladesh rents all of these services from satellite service provides in the region. It nearly costs around $14 million per year. Now Bangladesh can save the amount and rent out the excess capacity to other countries in the region and earn up to $50 million per year.

3.15.5.2 Stable macroeconomic scenario driving the growth in Bangladesh telecommunication sector

Bangladesh aspires to be a middle-income country by 2021, which will require increasing GDP growth to seven to eight percent per year. Post and telecommunications sector grew by 6.68 percent in FY 2017-18 with 2.58 percent contribution to GDP (at Constant Prices) during the year, according to BBS data. According to industry insiders, a one percent increase in mobile penetration could lead to an increase in the GDP growth rate by 0.28 percent, while a one percent increase in internet penetration can lead to an increase of up to 0.07 percent in the GDP growth rate. Communication services, particularly the mobile phone-based services (MPS) market continued to drive the telecommunications industry which led to the high growth of Post and Telecommunications sub-sector.

3.15.5.3 Growing population along with a large number of young and middle-aged group population are accelerating the pace of growth in the telecommunication industry

Approximately 35.8 percent of the population resides in urban areas and the annual rate of change in urbanization is 3.19 percent. Increased urbanization is transforming the traditional structure of communication and with increased digitalization, the country is progressing towards more connectivity. Widespread access to the internet is increasing and mobile phones have become part and parcel of everyday life. Young and middle-aged people are the major users of mobile communication devices and around 60 percent of the entire country belongs to these two groups.

3.15.5.4 Increased smartphone penetration resulting in higher data consumption

With increased smartphone market penetration and afterward the launching of 3G and 4G services in the country, mobile internet subscription witnessed tremendous growth along with growth in overall internet penetration. Currently, there are almost 100 million mobile phone devices in the country, according to industry experts. Use of smartphone in Bangladesh is growing in line with the reduction in smartphone prices and an increase in purchase power of people. According to Grameenphone Ltd., total smartphone penetration of the country stood at 28 percent as of August 2017. Along with branded smartphones, low-cost Chinese phone are driving the growth. Branded manufacturers have already started to manufacture/ assemble smartphones locally, which will bring affordability. Besides, prevailing 2G devices in the market are to be replaced with 3G and 4G enabled devices in the market which will bring more uses in data. Moreover, the proliferation of smartphones will continue and the number of data users will keep growing.

3.15.5.5 Heading towards "Digital Bangladesh" vision by the government driving the growth in the telecommunications industry

The government of Bangladesh is working towards accelerated use of information and digital communication systems to materialize its "Digital Bangladesh" vision by 2021, which is directly driving the growth in internet use in the country. Realization of this vision remains a political priority and is supposed to enable significant growth in the local telecom industry. Nearly all of the government services are now online-based, and they are also implementing aggressive campaigns to educate the masses about internet use alongside offering IT-based training programs and increased access to information technology. These efforts are culminating into a huge growth in internet uses. The government is also working to take the rate of internet penetration in the country to 100 percent from present 47.9 percent by 2021, ensuring high speed broadband internet at a cheaper rate to all the government offices, educational institutions, health centers and union parishads, expanding 3G network to all across the country and launching 4G.

3.15.5.6 Cultural transformation- driven by increased globalization

The country is undergoing a transformation journey in terms of its socio-economic factors; rapid changes have been observed in the lifestyle of its population. Heading towards globalization is also reshaping the prevailing culture as well as trade and commerce. Connectivity has been an integral part of modern-day life, thus accelerating the growth in mobile communication and internet uses. Meanwhile, use of social media platforms like Facebook, WhatsApp, Viber, and video streaming sites like YouTube now became part of everyday life for all classes of people mostly among the young and middle-aged group. And the use of such media is growing every day, ultimately resulting in more and more use of internet data. Steady population growth and increase in purchasing power will continue to drive the telecom sector growth.

Tourism

Domestic Market Size	Visitors Export	Employment	2023 Market Size
USD 5.3 B	228 M	0.85 M	USD 7.5 B

3.16 Tourism

As a complex industry, tourism requires a broad range of businesses, organizations, and government agencies to work together in different verticals to deliver a complete experience. Across the world, tourism is an important economic activity which helps to create jobs, drive export, and generate prosperity and the phenomenon is also similar in the context of Bangladesh. The country is blessed with natural beauty, ranging from mountains, rivers, beaches, biodiversity, ancient archaeological sites, medieval monasteries to temples, pagodas, mosques, churches and many more. It is heartening to note that Bangladesh has been ranked seventh in the Lonely Planet's, the world's largest travel guidebook publisher "top ten Best value" travel destinations for 2019 (The Daily Star, 2018). Despite increasing global interest in the country, Bangladesh could not come up with a well-coordinated plan to strengthen the sector yet.

3.16.1 Structure of the industry

Tourism industry consists of diverse cross-cutting verticals including accommodation, transportation, travel and tour operators, entertainment and recreational activities. This industry possesses the capacity to build a diverse economic base that supports the growth of many others cross sectors such as retailing, construction, and agriculture. by generating development opportunities for small business to meet increasing demands of goods and services. The growth of the tourism industry also has a direct positive impact on the development of rural communities. In addition, Bangladesh tourism industry is highly driven by MSMEs especially in the restaurant, region-based hotels, tour operators, and recreational activity. On the other hand, resorts, large hotels, and transport facilities are usually controlled by medium to large entities.

3.16.2 Statistics of Bangladesh tourism

During 2017, the tourism industry's direct contribution was reported to be $5.3 billion, which is approximately 2.2 percent of GDP of 2017. It is expected to rise by 6.8 percent per annum to $7.5 billion by 2028 (WTTC, 2018). The direct and indirect contribution of the industry was reported to be approximately $10 billion (WTTC, 2018). On the other hand, the total spending of Bangladeshi nationals in 2017 was $8.5 billion in both domestic and international traveling.

In the context of Bangladesh, the local tourists account for roughly 98 percent of the revenue generation. Among the rest two percent of foreign visitors, the *visitor exports* have generated $228 million in 2017 and expected to grow 6.20 percent per annum during 2018-2028 resulting in $445 million visitors export by 2028 (WTTC, 2018). Visitor exports refer to the spending within a country by international tourists for leisure and business purpose including spending on transportation, accommodation, and other related expenditures.

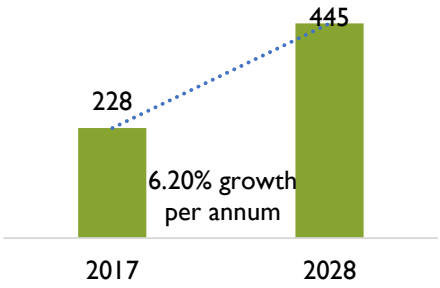


Figure 55: Potential growth of visitors

In addition, the direct employment contribution of the tourism sector during 2017 was approximately 1.17 million jobs (1.8 percent of total employment) and the total employment contribution was 2.43 million jobs, which is 3.8 percent of total employment. The number of employees in the tourism sector is expected to rise by 3.1 percent within 2028 (WTTC, 2018). Considering the job multiplier effect of the industry, with a change in demand worth $1 million, the tourism industry can generate 487 additional jobs. Such high multiplier is a result of high involvement of backward linkage and inter-sector value chain involvement.

Aligned with the sectoral growth, the investment in the sector is also increasing. Travel and Tourism sectors total domestic and foreign investment in 2017 was almost $1 billion and expected by 6.1 percent per annum over the next 10 years to $2 billion (WTTC, 2018). The foreign direct investment in the hotel industry was reported $170,000 in FY 2016-17 (Bangladesh Bank, 2016).

3.16.3 Available support of the industry

3.16.3.1 Fiscal support

- Cash incentive: Not Available
- Tax holiday**:** Not Available

- VAT exemption for import: Not Available

3.16.3.2 Non-fiscal support

- **Presence of sectoral roadmap:** Bangladesh Government has recognized tourism as an industry in 2010 and in contrast to that "National Tourism Policy 2010" was framed for the development of domestic and international tourism in the country (The Daily Star, 2018). On the contrary, there is no master plan or tourism guidelines developed for the growth of the industry. However, BTB has undertaken an initiative to draw up the much-awaited Tourism Master Plan.

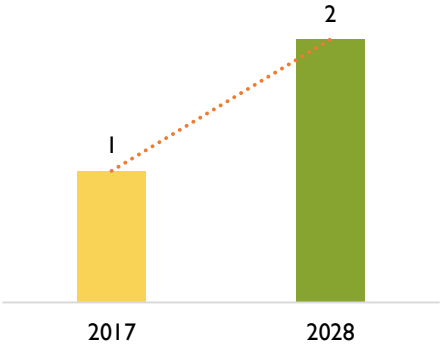


Figure 56: Total investment in Bangladesh tourism, in billion

- **Presence in export policy 2018-19:** Not available.

- **Presence in BIDA potential sector:** Tourism industry is also identified as a potential sector by BIDA. To boost the sector further, GoB plans to create a competitive tourism industry, including ecotourism and marine cruises. The *7th five-year plan* also encourages greater international travelers through simplified visa on arrival facilities, ensuring the full safety and hospitality of all visitors (The Daily Star, 2018).

- **Presence in the Industry Policy 2016:** Recognizing its potential tourism has been added as a priority sector under the service-oriented industry in National Industrial Policy 2016.

- **Presence in the economic zone planning:** The government has also enacted 'Tourism Protected Area and Exclusive Tourist Zone' Law in 2010 for attracting foreign investments in the EPZs. Tourism is added in the planning five economic zones where three zones named Naf Tourism Park, Sabrang Tourism Park and Sonadia Eco Tourism Park are focused on tourism only. In an extension of that, Bangladesh government has also taken several mega project initiatives such as, Chattogram - Cox's Bazar rail line, Dhaka-Cox's Bazar four-lane highway, expansion of the new airport, Padma bridge, tourism economic zone and development of roads and transportation system which will boost the growth of tourism industry.

3.16.4 Sustainability of the ecosystem

3.16.4.1 Employee inclusion

The tourism industry of Bangladesh consists of less than 13 percent of female employment in its workforce (Inspira Extrapolation, 2019). Such a low ratio is mainly caused by the lack of awareness of the industry which eventually leads to a negative perception of the work environment. Concurrently, the sector has high absorption potential for unskilled and semiskilled personnel and has an absorption potentiality of 93 percent unskilled employees (SEIP, 2017). Most blue-collar employees start working with very minimal or no skill at all, upon recruiting they are provided on the job training and gradually becomes fit for the job. However, the management level employees, chefs, supervisors, and technical individuals are hired only if they possess the required knowledge and expertise.

In addition, from a global context, the tourism industry is highly inclusive to local ethnic community in its value chain. Most hotels and resorts located in the remote area include the local community in the workforce. From Inspira extrapolation based on Key informant interview, on-site mission and amalgamation of existing research, it was identified that the possible inclusion of differently-abled and third gender is comparatively lower than other sectors. However, the lack of proper inclusion policy does not encourage the entrepreneurs to recruit such individuals.

3.16.4.2 Environmental inclusion

Tourism industry falls under "Orange - A" category in *Environmental Clearance Certificate.* Orange A refers to moderate negative footprint to the environment where the exact description of the raw materials and the manufactured product, no objection certificate from the local authority and effluent discharge arrangement must be reported. However, these

categories do not identify the passive impact tourism has on its ecosystem. Uncontrolled conventional tourism poses the biggest threat to the environmental ecosystem which put enormous pressure in the tourist zones and leads to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss and increased pressure on endangered species. Tourism contributes to more than five percent of global greenhouse gas emissions. Beyond carbon emissions and wasting natural resources, when an individual travel to a new community without understanding the area's social and economic life, they end up interrupting the ecosystem including all the living organisms (people, plants, animals, and microorganisms), their physical surroundings (such as soil, water, and air), and the natural cycles that sustain them. The most threatened with degradation are ecologically fragile areas such as alpine regions, rain forests, wetlands, mangroves, coral reefs, and seagrass beds. The threats to these ecosystems are often severe because such places are very attractive to both tourists and developers (GDRC).

3.16.5 Opportunities to boost the industry

Tourism economic zone: Three tourism parks at Cox's Bazar district named Naf Tourism Park, Sabrang Tourism Park, and Sonadia Eco-Tourism Park is being set up with a target to create 200,000 jobs. Naf Tourism Park is being built on a 271-acre island situated on the Naf River which flows along the Bangladesh-Myanmar border region (Dhaka Tribune, 2018). Siam International of Thailand will invest around $500 million out of the total budget of $3 billion for infrastructure development. Sabrang Tourism Park will be the first exclusive tourism park in the Cox's Bazar district encompassing an area of 1,027 acres. Sonadia Eco-Tourism Park in Moheshkhali is developing on 9,467 acres of land (Daily Star, 2018). The proposed three tourist parks are expected to raise the country's position on the tourist index to 99th from the existing 127th position. To support the industry entrepreneurs BEZA is set to offer a 100 percent tax exemption for the first 10 years, followed by 70 percent and 30 percent tax exemptions in the 11th and 12th year respectively in the tourism park (Dhaka Tribune, 2018).

Domestic aviation growth: The number of domestic air passengers in Bangladesh has increased by about 64.73 percent during 2017 compared to five years earlier. In 2013, the number of domestic air travelers was 600,000 which has increased to more than one million in 2017 and expected to increase to 21 million in 2035. At the same time, in 2013 a total of 12,526 flights to different domestic routes used to operate and in 2017 the number has increased to 38,057 (Dhaka Tribune, 2018). The healthy growth of air connectivity in the domestic market is also an indicator as well as opportunities for the tourism industry to grow further.

Business tourism: There are approximately 20,000 foreigners living in Bangladesh for professional reasons. In addition, the number of foreign visitors has increased by 22 percent in 2017 compared to last year, resulting in an entrance of more than 100,000 foreigners every year (WTTC, 2018). Unfortunately, only five percent of them come for the sole purpose of traveling. Hence, there is a tremendous potentiality to divert the business tourists toward Bangladesh recreational tourism activities through promoting the sector correctly.

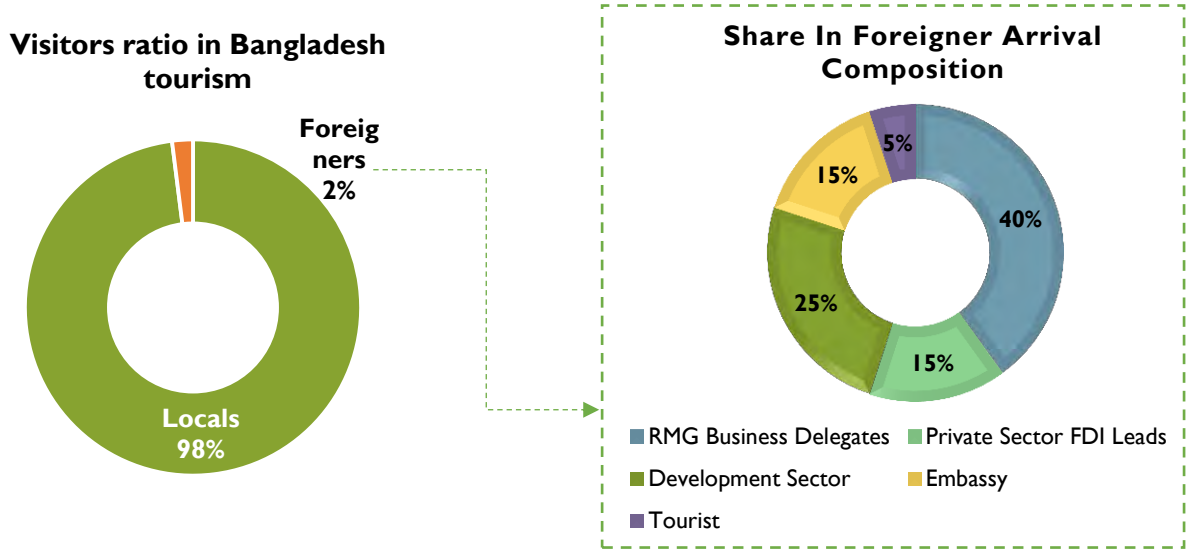


Figure 57: Visitor ration in total tourism sector

Luxury hotel growth: With a 22 percent year on year growth of foreign entrance the demand for upscale hotel rooms has increased too. To meet the required demand approximately $650 million is being invested by IFC, premium hotel chains and local franchisee. It is estimated that the supply of upscale room will increase to 140 percent by 2021 (News Today, 2019). At the same time, the hotel industry has earned additional revenue of around $35 million per annum due to Rohingya influx in Cox's Bazar region.

Religious tourism: An estimated 300 to 330 million pilgrims visit the world's key religious sites every year (UNWTO, 2014). Bangladesh can become one of the prominent destinations for religious tourism is promoted correctly. The highlights of Bangladesh include the Buddhist remains at Paharpur, the fifteenth-century mosques, and mausoleums of Bagerhat, both of which are UNESCO World Heritage Sites. Despite the fact that in Bangladesh the majority is Muslim; its hill tracts are still home to Buddhist and Christian Adivasi tribal peoples. At the same time, the vast number of temples in Dhaka and beyond attest is enough to influence of Hindu culture in the country.

Medical tourism: Bangladesh medical tourism is developing as a niche market over several decades mainly in the areas of non-surgery and non-mainstream treatment procedures like India and Nepal. The country has a traditional reputation in areas of medical tourism that covers herbal, homeopathy, and Unani and Ayurveda medicines. However, the tourism world is still unaware of the services, benefits, and offering of medical tourism in Bangladesh.

Cross country tourism: Bangladesh has the potential to attract global tourists especially from the western countries visiting India, Nepal, and Myanmar by offering its attractive locations and services as an extended destination. At the same time, there is another great opportunity to promote cross-border tourism among SAARC countries just like the European countries.

MAC consumer base and domestic tourism growth: Bangladesh has joined the club of the developing nations. The per capita income has risen many times since independence in 1971 from less than $100 to more than $1,750 in 2018 (Trading Economics, 2018). This great jump in the national income level brought in affluence and created a sizeable number of the middle class with disposable income which is a potential source to spend in tourism purposes such as leisure, education, health, and sports.

New emerging inbound destinations: There are over 700 spots of tourist interest in the country which include nature-driven ones like sea beach, green valleys, forests, archaeological and historical sites, iconic religious places, cultural events, and man-made wonders. At the same time, with increasing young tourists who possess a high interest in exploring new areas the activity around domestic tourism has been increasing rapidly. Due to the popularity of social media platforms such as Facebook, more and more people are becoming aware of new locations that hold potential for tourism in the country, in lesser-known hill, beach and forest areas.

Blue economy initiatives and growth opportunities: The marine and coastal environment also constitutes a key resource for the important global tourism industry and expanding the domain of nature-based tourism. Globally, coastal tourism is the largest market segment that represents five percent of world GDP and contributes to six to seven percent of total employment. Coastal tourism can be attracted through beach-based recreation and tourism, tourist activities in proximity to the sea, marine boating including yachting and marinas, water sports activities and many more.

Branding around value destination: Bangladesh is a great place as a low cost value destination country with countless untapped treasures for travelers and backpackers, who seek affordable adventures. There are numerous options for an affordable hotel along with inexpensive public transportation such as bus, train, ship, and rickshaws to go from one destination to another. With a diverse and exotic cuisine that is remarkably cheap, it is no wonder Bangladesh is one of the top destinations to visit in 2019.

Internet and online startups: Digital technologies have connected the tourism industry on a global level and helped to become a crucial ally for sustainable development. With the tourism trend going up in Bangladesh, a new breed of companies, enabled with technology, entering the market to grab this growing demand. *Vromon*, *Tripping,* and *Jovago* are such online startups who are assisting in choosing a travel destination, book hotels, choose from multiple tour packages, book other services and many other services.

3.16.6 Key challenges hindering the growth

Lack of branding and promotional activity: Despite having a culturally rich heritage and great tourist spots, Bangladesh possesses a negative image mostly caused by the lack of country promotion and poor tourist management. Unfortunately, Bangladesh did not yet take any appropriate steps to counter its negative image abroad as a country that faces poverty, floods, and cyclones. Such negative image is caused by numerous publications in international media which resulted in to create misconception among the potential tourists. As a result, many foreigners do not choose Bangladesh as a tourist destination. Bangladesh stands at the 125th spot out of 136 countries, behind all other countries from South Asia (WEF, 2017).

Inadequate Infrastructure: Poor infrastructure of roads, transport facilities, security, poor tourist management, scarcity of entertainment facilities and night time activities are deterring the reputation of Bangladesh tourism. In addition, the quality of public transportation and heavily congested land transportation is also a key constraint to the growth of the tourism industry.

Concentrated tourist attractions: Bangladesh tourism industry is highly concentrated in a few regions. Among seventy lac travelers per annum, 3.7 million travels to Cox's Bazar, 25 lacs to Chattogram, eight lacs to Sylhet and rest travel around north Bengal. Such spread of tourism hampers the ecosystem of those regions whereas other zones left unexplored (Daily Star, 2018).

Region-wise number of visitors

Figure 58: Region-wise tourist

Cost of doing business: Regardless of the key challenge of infrastructural blockage, the cost of doing business, unjustified amount of tax, extremely high-interest rate and access to finance are the major challenge from the entrepreneurs' side. In addition, the lack of strong policy support for idea protection, investment protection, and patents are the other factors which discourage the entrepreneurs to take the risk.

Poor certification policy: In contrast to the high importance of quality assurance in the industry, the appropriate certification policy for hotels, restaurants, and resorts, an adequate policy is absent. Despite having present safety regulations and laws to support the industry, many certifications can be availed even without required infrastructure.

Lack of skilled labor force: Irrespective of being a highly populated country along with high unemployment rate, there is a vast scarcity of skilled human resources in the service industry especially in tourism and hospitality management. To support the demand, there are more than 30 institutes that cater to the needs of the industry including Dhaka University (leading public university of Bangladesh), Bangladesh Parjatan Corporation (government nodal agency), and National Hotel and Tourism Training Institute. Yet this is rather meager in terms of the country's demand and cannot ensure the quality as per requirement.

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Annexure

List of Key Informants

Industry	Entity Name	Name& Designation
Agriculture/Fish & Shrimp	ACI Limited	Mr.Masuk Hossain Khan, Strategic Planning Manager
Agriculture	OGGRO	Farzeen F Alam, Chairman
Agriculture	BANGLADESH AGRO-PROCESSORS ASSOCIATION (BAPA)	Muhammad Shoaib Hassan, Vice President
Agriculture	PRAN-RFL Group Bangladesh	Eleash Mridha, Managing Director
Agriculture	Virgo Fish & Agro Process Ltd.	Md. Nurul Afsar Chandan, General Manager,
Agriculture	Rangamati Chamber of Commerce and Industry	Mr. Shabbir Ahmed, Secretary
Agriculture	Farmers Market Asia	Shourav Islam, Founder
Automotive/Bus/Truck Assembly	Runner Group of Companies	Mr. Hafizur Rahman Khan, Chairman, Former President, IBFB
Automotive/Bus/Truck Assembly	Uttara Motors Ltd.	Dileep Banerjee, CEO
Automotive/Bus/Truck Assembly	Nitol Niloy Group	Abdul Matlub Ahmad, Chairman
Ceramic	Monno Ceramic Industry, BCMEA	Mr. Moynul Islam, Vice Chairman, Sr. Vice President, BCMEA
Ceramic	Fu-Wang Ceramic Industry	Rafiquzzaman Bhuiyan, CEO
Ceramic	Bangladesh Ceramic Ware Manufacturers Association (BCWMA) & Farr Ceramics	Irfan Uddin, General Secretary & Director of Farr ceramics
Entrepreneurship	Sheba.xyz	Adnan Imtiaz Halim, CEO
Entrepreneurship	Startups from multiple sectors under BD Angles & Start up Dhaka	Key Entrepreneurs
Govt. Bodies	PPP Authority	Md. Abu Rashed, PPP Expert (Advisor)
Govt. Bodies	Bangladesh Investment Development Authority (BIDA)	Nabhash Chandra Mandal, Additional Secretary
Govt. Bodies	Bangladesh Economic Zones Authority (BEZA)	Paban Chowdhury, Executive Chairman
Govt. Bodies	Bangladesh Economic Zones Authority (BEZA)	Mohammed Ayub, Additional Secretary
Govt. Bodies	Bangladesh Investment Development Authority (BIDA)	Kazi M. Aminul Islam, Executive Chairman
Health	Ministry of Health and Family Welfare (MoHFW)	Dr. Md. Aminul Hasan, Deputy Director, QIS
Healthcare	Maya Apa	Dr. Sayla Ahmed, Expert Team lead
Healthcare	Universal Medical College & Hospital Limited & International Business Forum of Bangladesh (IBFB)	Priti Chakraborty, Chairman & director respectively
Healthcare	PRAAVA Health	Sylvana Q. Sinha, CEO
Healthcare	Apollo Hospital	Akhter Jamil Ahmed, Deputy General Manager
ICT	a2i	Anir Chowdhury, Policy Advisor
ICT	Leveraging ICT	Sami Ahmed, Component Team Leader
ICT	Bangladesh Open Source Network	Munir Hasan, General Secretary
ICT	Graphic people Ltd	Mr. Imtiaz Ilahi, Managing Director
ICT	DataSoft Systems Ltd	M Manjur Mahmud, Director and COO, DataSoft Systems Ltd
ICT and outsourcing	Digicon Technologies Ltd	Azmal Haque Azim, Director
ICT, Entrepreneurship	BACCO	Tanvir Ibrahim, VP

Leather & Leather Goods	Karigar	Tania Wahab, Managing Partner
Leather & Leather Goods	TK Footwear (Chittagong)	Sokul kanti Dey (Biplob), General Manager
Leather & Leather Goods	Leather goods & Footwear Manufacturers & Exporters Association	Md. Saiful Islam, President, MD of Picard Bangladesh
Leather & Leather Goods	Apex Footwear Limited	Md. Syed Manzur Elahi, Chairman
Leather & Leather Goods	Craftsman Footwear & Accessories Limited	Sadat Hossain Salim, Chairman
Light Engineering	Bangladesh Engineering Industry Owners Association (BEIOA) & Sunrise Engineering	Abdur Razzak, President of BEIOA, CEO of Sunrise Engineering
Light Engineering	Bangladesh Engineering Industry Owners Association (BEIOA)	Md. jamal uddin, Assistant publicity secretary, Owner of Zam Zam Engineering
Light Engineering	Walton Group	Abdur Rouf, Additional Director
Light Engineering	RFL Bike Group	Mr Joynul Abedin, COO
Medical Equipment	Bi-BEAT Limited	Khondkar Siddique-e-Rabbani, Chairman
Multi sector	East Coast Group	Azam J Chowdhury, Chairman
Multi sector	New age Group	Asif Ibrahim
Multi sector	Dhaka Chamber of Commerce & Industry (DCCI)	AKM Asaduzzaman Patwary, joint Secretary (R&D)
Multi sector	Chittagong Chamber of Commerce & Industry (CCCI)	Mr. Mahbubul Alam, President
Multi sector	Ministry of commerce	Md. Mofizul Islam, Secretary
Multi sector incl. Agri-b, energy	YY Ghosti	Shazeeb M Khairul Islam, CEO
Multi sector incl. Agri-b, energy	SNV	Jamal Uddin, Inclusive Business Advisor
Multi sector incl. Agri-b, energy	BCG	Tausif Ishtiaque, Project Leader (Malaysia)
Multi-sector	The World Bank	Dr. Zahid Hussain, Lead Economist
Pharmaceuticals	One Pharma Ltd.	K S M Mostafizur Rahman, Managing Director
Pharmaceuticals	ACI Pharmaceuticals Ltd.	M Mohibuz Zaman, Managing Director, ACI Healthcare Ltd.
Pharmaceuticals	The ACME Laboratories	Mizanur Rahman Sinha, Managing Director
Pharmaceuticals	JMI Group	Abdur Razzaq, Managing Director
Plastic	N. Mohammad Plastic Industries	Mr. Mokhlesur Rahman, Director
Plastic	14th Bangladesh International Plastic, Packaging and Printing Industrial Fair	
Plastic	Aman Plastic industries	Md. Aman Ullah, Chairman
Plastic	RFL Group	Rathendra Nath Paul, Managing Director
Plastic	Bangladesh Petrochemical Company Limited (Plastic Recycling)	Khadem Mahmud Yusuf, Managing Director & CEO
Renewable energy and energy efficiency	ME SOLshare	Sebastian Groh, MD
Renewable energy and energy efficiency	Power Division, SREDA EEC	Siddique Zobair, Joint Secretary, Power Division
Renewable energy and energy efficiency	Rahimafrooz Renewable Energy	Mustafizur Rahman, COO
Renewable energy and energy efficiency	Summit Corporation Ltd	Syed Sohel, Executive Director
Renewable energy and energy efficiency	Centre for Energy Research	Shahriar Ahmed Chowdhury, Director
Renewable energy and energy efficiency	Infrastructure Development Company Limited (IDCOL)	Md. Enamul Karim Pavel, Head of Renewable Energy

Renewable energy and energy efficiency	Joules Power Limited	Nuher L. Khan, Managing Director
Renewable energy and energy efficiency	Northwest Power Generation Company Limited	Engr. A.M. Khurshedul Alam, CEO
Ship Building	Western Marine	Mr. Shakhawat Hossain, MD
Ship Building	Prantik Group (Chittagong)	Mr. Md. Golam Sarwar, Managing Director
Ship Building	FMC Group	Mohammad Yasin Chowdhury, Chairman
Shrimp & Fish	Irawan Trading (Chittagong)	Aung Chin, Owner & Pioneer of Crab production
Shrimp & Fish	Bangladesh Shrimp and Fish Foundation (BSFF)	Mr. Syed Mahmudul Huq, Chairman
Telecommunication	ISP Association Bangladesh (ISPAB)	Md. Emdadul Hoque, GS
Telecommunication	Amber IT	Mohammed Aminul Hakim, CEO
Tourism	Bangladesh Parjatan Corporation	Sabur Mondal, Joint Secretary and Director
Tourism	Amazing Tours	Mohosin Iqbal, CEO
Tourism	Sairu Hill Resort	Mustafa Ameen, Managing Director
Tourism	Nazimghar Resort	Mr. Nazim Farhan, Director
Tourism	Base Camp Bangladesh	Tamzid Siddiq Spondon, Cofounder and Managing Director
Tourism	Association of Travel Agents of Bangladesh (ATAB)	