

# **People's Republic of Bangladesh**

## **STI Profile of the OIC Member State**

### **Science, Technology and Innovation Indicators**



**COMSTECH**

## **Editor:**

Prof. Dr. S. Khurshid Hasanain  
Adviser COMSTECH

## **Data Collection & Layout:**

Mr. Umer Ali  
Programme Officer COMSTECH

Mr. Muhammad Jamil  
PS COMSTECH

Dr. Waseem Hassan  
Associate Professor, University of Peshawar

# FOREWORD

It gives me great pleasure to share the *Science, Technology and Innovation Profiles of OIC Member States*, as prepared by COMSTECH. These profiles of member states are being printed, as well as shared on the COMSTECH website. A few words are therefore presented to explain the wider aims and purposes of this exercise.

The member countries of the OIC are vigorously engaged with science, technology and innovation, both as a pursuit of knowledge and in harnessing the forces of nature for human betterment. Depending on their circumstances they have advanced to different levels, but much needs to be done, in general, to catch up with the attainments of the more advanced countries. However, there exists a well-defined need to catalogue national efforts in this direction. In particular, to identify respective strengths, achievements and shortcomings, as well as the institutions and policies that are shaping the scientific research and development profiles of OIC member states.

It is with the above goals and purposes that COMSTECH has ventured on this ambitious task viz. preparing a summarized version of the science, technology and innovation landscape of each member state. We have initiated this effort starting with the profiles of countries leading in this area, and will be continuing and sharing as we proceed onwards.

Undoubtedly much more could be said about each country than the summary that we have presented, but our emphasis is on the essentials and on maintaining brevity. COMSTECH welcomes feedback from member states on this effort and will be happy to update the website profiles on the basis of information received officially.

I hope that the scientific community as well as the planners and administrators of member states will find these profiles both useful and inspiring.

Prof. Dr. M. Iqbal Choudhary  
*Coordinator General COMSTECH*  
*UNESCO Chair*

# CONTENT DISCLAIMER

The views mentioned in the document are those of authors and may not necessarily represent or reflect the views of everyone reading it. We have tried our best to mention source of every information or data we have shared in this document. The sole purpose of the content is for knowledge and awareness of readers/consumers.

Copyright Disclaimer, Under Pakistan's COPYRIGHT ORDINANCE 1962, allowance is made for 'fair use' for purposes such as criticism, comment, news reporting, teaching, and research.

Fair use is a use permitted by copyright statute that might otherwise be infringing. Non-profit, educational, or personal use tips the balance in favor of fair use. If you have a complaint about something or find our content to be inaccurate or incomplete. Please contact COMSTECH prior to making any complaint. Any infringement if found was not done on purpose.

[www.comstech.org](http://www.comstech.org)

# CONTENTS

Following is the list of topics covered in the STI profiles of OIC Member States. All sub-sections/topics may not appear for every country due to unavailability of some data.

## **1. Country Overview**

- a. Brief history
- b. Geography
- c. Population
- d. Main occupations
- e. National highlights

## **2. Economic Overview**

- a. GDP (US\$ billions)
- b. GDP performance by sector
- c. High tech exports
- d. Key economic initiatives

## **3. Social and Human Development**

- a. Skilled labour force
- b. Employment percentage
- c. Access to electricity, and internet
- d. Life expectancy and literacy
- e. Human Development Index (HDI)

## **4. Key Government Organizations and Policy frameworks for S&T and Higher Education**

- a. Key policy frameworks for STI policy
- b. Key ministries and organizations responsible for science, technology and higher education
- c. Major research centres and institutes



# CONTENTS

## **5. Research and Development**

- a. GERD as percentage of GDP
- b. GERD: by sources of finance
- c. Researchers by sector of employment
- d. Researchers intensity (Researchers per million inhabitants)
- e. Researchers distribution in major fields
- f. Key areas of focus (Interest of policy makers, governing bodies and businesses)

## **6. Higher Education**

- a. Top ranked universities
- b. Tertiary graduates by field of study
- c. Key public institutions and key private institutions

## **7. Research Publications**

- a. Number of research publications (Articles); recent trend
- b. Number of research documents; historical trend
- c. Impact of research documents; scholarly output, citations, Citations per Publication (CPP), Field Weighted Citation Impact (FWCI)
- d. Distribution of publications over different fields or subject areas.
- e. Publications quality or ratings as per quartile sets.
- f. Most productive universities/institutions based on the number of scholarly output.
- g. Trend of international collaborations (%)
- h. Top collaborators in scientific research publications

# CONTENTS

## **8. International Cooperation and Support Initiatives**

- a. Key agreements and cooperation mechanisms with other countries
- b. Bilateral, regional, and international agreements and partnerships.

## **9. Innovation, Entrepreneurship and Technology Parks**

- a. Number of patents granted
- b. Global Innovation Index (GII)
- c. Major policies/initiatives for innovation
- d. Technology parks, incubation centres & startups promotion

## **10. Combating the COVID-19 pandemic**

- a. Vaccine development and/or administration efforts
- b. Indigenous production to meet pandemic requirements
- c. Mobile applications to support country's effort



# BANGLADESH

, officially the People's Republic of Bangladesh, is a country in South

Asia. It is the eighth-most populous country in the world, with a population exceeding 163 million people in an area of 148,460 square kilometres (57,320 sq mi), making it one of the most densely populated countries in the world. Bangladesh shares land borders with India to the west, north, and east, and Myanmar to the southeast; to the south it has a coastline along the Bay of Bengal. It is narrowly separated from Bhutan and Nepal by the Siliguri Corridor; and from China by 100 km of the Indian state of Sikkim in the north. Dhaka, the capital and largest city, is the nation's economic, political, and cultural hub. Chittagong, the largest seaport, is the second-largest city. The official language is Bengali, one of the easternmost branches of the Indo-European language family.



Bangladesh forms the sovereign part of the historic and ethnolinguistic region of Bengal, which was divided during the Partition of India in 1947. The country has a Bengali Muslim majority. Ancient Bengal was an important cultural centre in the Indian subcontinent. The Muslim conquest of Bengal began in 1204 when Bakhtiar Khalji overran northern

Bengal and invaded Tibet. Becoming part of the Delhi Sultanate, three city-states emerged in the 14<sup>th</sup> century, while Sufi missionary leaders helped in spreading Muslim rule. Under Mughal rule, eastern Bengal continued to prosper as the melting pot of Muslims in the eastern subcontinent and attracted traders from around the world.

In 1947, East Bengal became the most populous province in the Dominion of Pakistan. It was renamed as East Pakistan with Dhaka becoming the country's legislative capital. The 1970 Pakistani general election resulted in the rise of Bengali nationalism and pro-democracy movements in East Pakistan and to the Bangladesh Liberation War in 1971. Resultantly, the new state of Bangladesh became the first constitutionally secular state in South Asia in 1972. Islam was declared the state religion in 1988. In 2010, the Bangladesh Supreme Court reaffirmed secular principles in the constitution.

Bangladesh is a unitary parliamentary constitutional republic based on the Westminster system. Bengalis make up 98% of the total population of Bangladesh, and the large Muslim population of Bangladesh makes it the third-largest Muslim-majority country. The country consists of eight divisions, 64 districts and 495 subdistricts. It maintains the third-largest military in South Asia after India and Pakistan, and has been a major contributor to UN peacekeeping operations. A middle power in the Indo-Pacific, Bangladesh is an emerging economy ranked as the 41<sup>st</sup> largest in the world by nominal GDP, and the 30<sup>th</sup> largest by PPP. It hosts one of the largest refugee populations in the world due to the Rohingya Muslims genocide. Bangladesh faces many challenges, including the adverse effects of climate change and poverty. However, the poverty rate has halved since 2011. Once a historic center of the muslin cloth trade, Bangladesh is now one of the world's largest modern garment exporters. Its economy has constantly been among the fastest growing economies in the 21<sup>st</sup> century.

Source: <https://en.wikipedia.org/wiki/Bangladesh>



## A. ECONOMIC OVERVIEW

Bangladesh has the world's 33<sup>rd</sup> largest economy in terms of market exchange rates and 29<sup>th</sup> largest in terms of purchasing power parity, which ranks second in South Asia after India. Bangladesh is also one of the world's fastest-growing economies and one of the fastest growing middle-income countries. The country has a market-based mixed economy. A developing nation, Bangladesh is one of the Next Eleven emerging markets. According to the IMF, its per-capita income was US\$1,906 in 2019, with a GDP of \$317 billion. Bangladesh has the second-highest foreign-exchange reserves in South Asia (after India). The Bangladeshi diaspora contributed \$15.31 billion in remittances in 2015. Bangladesh's largest trading partners are the European Union, the United States, Japan, India, Australia, China and ASEAN. The economy is driven by strong domestic demand.

Since 1991 the Bangladeshi private sector has rapidly expanded, with a number of conglomerates driving the economy. Major industries include textiles, pharmaceuticals, shipbuilding, steel, electronics, energy, construction materials, chemicals, ceramics, food processing, and leather goods. Export-oriented industrialisation has increased with fiscal year 2018–19 exports increasing by 10.1% over the previous year to \$40 billion. Most export earnings are from the garment-manufacturing industry.

However, an insufficient power supply is a significant obstacle to Bangladesh's economic development. Bangladesh is the seventh-largest natural gas producer in Asia, and 56 percent of the country's electricity is

generated by natural gas. It has substantial coal reserves, with several coal mines operating in the northwest. Bangladesh has one of the world's oldest tea industries and is a major exporter of fish and seafood.

Bangladesh's textile and ready-made garment industries are the country's largest manufacturing sector, with 2017 exports of \$34.1 billion. Leather-goods manufacturing, particularly footwear, is the second-largest export sector. The pharmaceutical industry meets 97 percent of domestic demand, and exports to many countries. Shipbuilding has grown rapidly, with exports to Europe.

In 2005 Bangladesh was the world's 20<sup>th</sup> largest cement producer, while food processing is also a major sector. The electronics industry is growing rapidly with contributions from companies like the Walton Group.

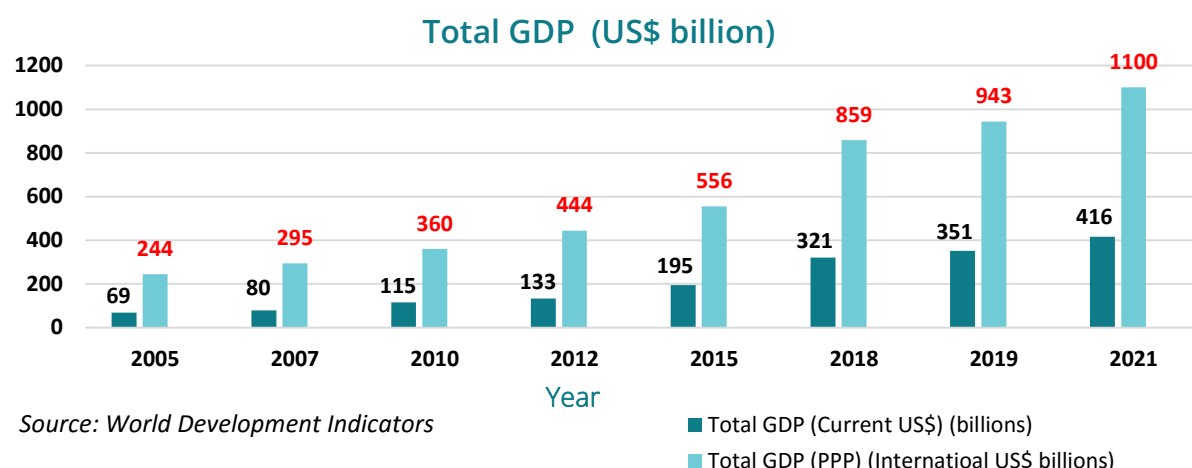
The service sector accounts for 51 percent of the country's GDP. Bangladesh's telecommunications industry is one of the world's fastest-growing, with 171.854 million cellphone subscribers in January 2021.

Following the pioneering work of Akhter Hameed Khan on rural development at Bangladesh Academy for Rural Development, several NGOs in Bangladesh including BRAC (the world's largest NGO), and Grameen Bank, focused on rural development and poverty alleviation in the country. Muhammad Yunus successfully pioneered microfinance as a sustainable tool for poverty alleviation and others followed suit. As of 2015, the country had over 35 million microcredit borrowers. In recognition of their tangible contribution to poverty alleviation, Muhammad Yunus and Grameen Bank were jointly awarded the Nobel Peace Prize in 2006.

Source: <https://en.wikipedia.org/wiki/Bangladesh>

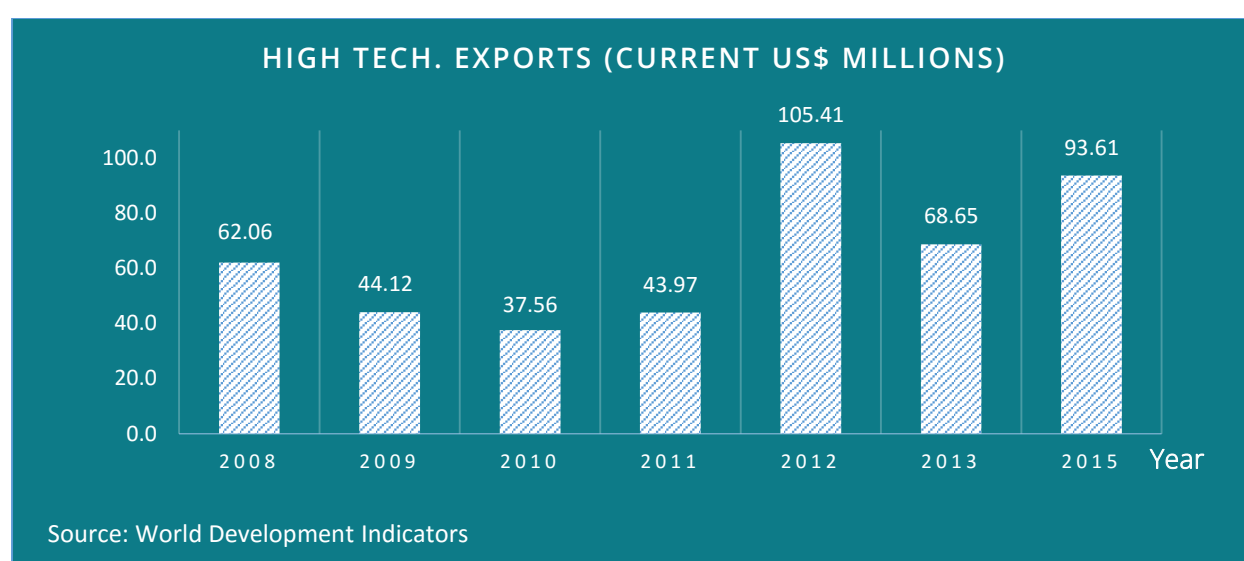
### ❖ **GDP Trend in Recent Years**

Bangladesh has shown an impressive and consistent rise in its GDP from US\$69 billion (current US\$) in 2005 to US\$416 billion in 2021; an increase of over 500% over the past sixteen years. The GDP in terms of PPP also shows a consistent increase over the entire period shown, averaging an annual growth rate of almost 22% in the sixteen year period (2005-2021). The GDP per capita of Bangladesh is US\$4754 (in 2017\$ PPP).



Manufactured exports constitute 95.8% of all merchandize exports of Bangladesh.

## ❖ High Technology And Other Technological Exports



The high technology exports of Bangladesh increased from US\$ 62 billion in 2008 to 93.6 billion in 2015 comprising 0.3% of all exports. There is an anomalous increase in 2012 where they rise to 105.4 billion, else the trend from 2009 onwards is one of steady growth.

Between 2010 and 2015, the pharmaceutical industry almost doubled its earnings to US\$ 1635 million, according to the Bangladesh Association of Pharmaceutical Industries. Dominated by local companies, this sector contributed 1.85% of GDP in 2016–2017, according to the Bangladesh Bureau of Statistics. Bangladesh is, by far, the largest exporter of pharmaceutical products among least developed countries; the Export



Promotion Bureau recorded export earnings of US\$135.8 million in 2020, almost double the amount six years earlier (US\$ 69.2 million).

The automobile industry, meanwhile, is gradually migrating from the assembly of parts produced abroad towards value added manufacturing (Govt of Bangladesh, 2020), in line with the draft Automobile Development Policy 2020. In September 2020, the Minister of Industries announced plans for a joint endeavour between the state-run company Pragati Industries and the Japanese company, the Mitsubishi Corporation, for the local manufacture of automobiles.

By 2019, value-added manufacturing was contributing 19% of GDP in Bangladesh, according to the World Bank, up from 16% in 2012.

### ➤ **Shipbuilding in Bangladesh**

**Bangladesh is a major shipbuilding nation** and has a long history of shipbuilding. The industry has shown growth in recent years when locally made ships began to be exported. Bangladesh has now over 200 shipbuilding companies, mostly concentrated in Dhaka, Chittagong, Narayanganj, Barisal and Khulna. The number of skilled and semi-skilled people employed in the shipbuilding industry of Bangladesh is estimated to be about 150,000. Total output was estimated to be about 250,000 gross tons (GT) per year in 2011, of which 185,000 GT were for the local market.





## B. SOCIAL AND HUMAN DEVELOPMENT

### ❖ Human Development

Series Name	2016	2017	2018	2019	2020
Life expectancy at birth, total (years)	71.785	72.052	72.32	72.591	72
Literacy rate, adult total (% of people ages 15 and above)	72.76	72.90	73.91	74.68	74.91
Literacy rate, adult female (% of females ages 15 and above)	69.90	70.09	71.18	71.95	72.00
Labor force with advanced education (% of total working-age population with advanced education)	77.52	79.64	..	..	..
Mortality rate, infant, male (per 1,000 live births)	31.2	29.8	28.4	27.1	25.9
Individuals using the Internet (% of population)	18.1	19.8	21.8	23.8	24.8
Mobile cellular subscriptions (per 100 people)	86.08	94.53	100.24	101.55	103.31

Source: [Data from database: World Development Indicators](#)

Bangladesh has a current population of 163 million and a population growth rate of 1.0%. With a human development index of 0.661, it ranked 129<sup>th</sup> among 191 countries in this year's (2022) Human Development Index, according to Human Development Report 2021-22. In the previous report published in 2020, Bangladesh ranked 133 out of 189 countries.



It has an average life expectancy at birth of 72.59 years and an adult literacy rate of 74.9% which is slightly lower for females (72.5%). There were 52.58 million internet users in Bangladesh in January 2022 showing an internet penetration rate of 31.5 % of the total population. Mobile cellular subscriptions (per 100 people) increased from 86% in 2016 to 103.31% in 2020.

Between 2015 and 2020, the share of the population with access to electricity leapt from 76% to 96%. The Ministry of Power, Energy and Mineral Resources has set the target of boosting power generation capacity to 24 000 MW by 2021 and 40 000 MW by 2030. Gains in power-generation capacity are expected to be made through imports of coal and liquid natural gas (Govt. of Bangladesh, 2020).

Source: <https://hdr.undp.org/sites/default/files/Country-Profiles/UZB.pdf>

## ❖ Skilled Labour Force



Source: Human Development Report: <http://www.hdr.undp.org/en/indicators/179406>

Bangladesh's skilled labour force has increased slightly from 22.2% to 25.8% of the total labour force since 2006. However, the increase does not appear to be a consistent growth as shown in above figure.

❖ **National Council for Science and Technology (NCST)**

## ❖ Ministry of Science and Technology (MoST)

- Its main activities include formulating national policies on science and technology and coordinating science and technology based initiatives and activities of different Ministries. It is also responsible for implementation of recommendations of the NCST.
- MoST also provides grants and overall assistance to agencies /institutions in the science and technology sector.
- It is also responsible for liaising with different countries and international organizations in the science and technology sector and also implementing agreements and assistance programmes in relevant sectors.
- MoST also takes care of activities relating to atomic security and radiation control and establishment of atomic power plants. It coordinates potential and new technology-based research activities and assists in the development of the related infrastructure and human resources.

- It is also tasked with promoting, extending and popularizing new science related initiatives.

❖ **The Ministry of Science and Technology** has the following organizations functioning under it:

- Bangladesh Atomic Energy Commission
- Bangladesh Council of Scientific and Industrial Research
- National Museum of Science & Technology
- Banglabandhu Sheikh Mujibur Rahman Novo theatre
- Bangladesh Atomic Energy Commission
- Bangladesh Council of Scientific and Industrial Research
- National Museum of Science & Technology
- Bangladesh Atomic Energy Regulatory Authority
- National Institute of Biotechnology
- Bangladesh Oceanographic Research Institute BORI
- Nuclear Power Plant Company Bangladesh Limited
- Bangladesh Reference Institute for Chemical Measurements
- Bangladesh National Scientific & Technical Documentation Centre
- Banglabandhu Science & Technology Fellowship Trust

Source: <https://most.gov.bd/#>

## ❖ **Ministry of Posts, Telecommunications and Information Technology**

To give more thrust for ICT sector the Information & Communication Technology Division was separated from Science and Technology ministry and it was upgraded as Ministry of Information & Communication Technology in 2011. The change is the evidence of understanding of the importance of ICT from the highest policy level and also an indication that the government is keen to keep pace with modern changing world. After 2014 election, Ministry of Posts and Telecommunications and Ministry of ICT have been integrated into the Ministry of Posts, Telecommunications and Information Technology.

The Administrative Arrangements Order made on 14 September 2015 detailed the following responsibilities to the ministry:

- Broadband policy and programs
- Postal and telecommunications policies and programs
- Spectrum policy management

- National policy issues relating to the digital economy
- Content policy relating to the information economy



## ❖ Key Science Policies

NST Policy 1986, the draft national science & technology policy, 2006, and National Science and Technology policy 2011 have been formulated.

The 2011 NST policy (NSTP) has the following main objectives:

- To ensure application(s) of science, technology and innovation (ST&I) for achieving sustainable economic growth with due attention to employment generation, poverty alleviation, gender equity and environmental sustainability.
- The NSTP identified the National Council on Science and Technology (NCST) and an Executive Committee of NCST (ECNCST), to submit recommendations on the priorities mentioned in the NSTP and also monitor the implementation of the directives and decisions of the NCST.
- The NCST will (a) Formulate national policies on science and technology for social and environmental development and devise strategy for technological self-reliance.
- The policy foresaw the establishment of an Engineering Research Council to identify priority areas for research, to coordinate existing research bodies and to support the commercialization of research results and the adaptation of imported technology. In September 2020, parliament passed the Bangladesh Engineering Research Council Bill (BES, 2020).
- The NSTP set a target of 2% for research intensity and identified the following priority areas for research:
  - green technology, especially for 'harnessing natural resources';

- ecosystems as carbon sinks;
  - ICTs, biotechnology and nanotechnology; and
  - basic sciences
- **ICT Policies:** The first ICT Policy of Bangladesh was formulated in 2002. The ICT Policy was revised in 2008 and the revised ICT Policy was adopted by the government in April 2009. National ICT Policy 2015. The latest national ICT Policy 2018 builds on the previous iteration to account for the emergence of 5G technology and the challenges of the Fourth Industrial Revolution.
  - **Vision 2021 (2007)** set out to turn Bangladesh into a middle income country by 2021. A first **Perspective Plan (2012)** operationalized this blueprint. **The Second Perspective Plan (2021–2041)** was approved by the National Economic Council in February 2020. It prioritizes sustainable energy and the development of roads, transport and infrastructure on the path towards becoming a developed country by 2041.
  - **An Artificial Intelligence AI Strategy** to overcome data and talent shortages. Bangladesh has developed a draft National Strategy for Artificial Intelligence for 2019–2024, with support from USAID and the United Nations Environment Programme. The strategy identifies seven national priority sectors for artificial intelligence (AI): public service delivery; manufacturing; agriculture; smart mobility and transportation; skills and education; finance and trade; and health.

## ❖ Key Research Organizations

- **Bangladesh Council of Scientific and Industrial Research (BCSIR)** is a scientific research organization and regulatory body of Bangladesh. Its main objective is to pursue scientific research for the betterment of the Bangladeshi people. It was established on 16 November 1973.

BCSIR is an autonomous organization under the Ministry of Science and Technology, Government of Bangladesh. It has academic and scientific staff of 473, including 100 Ph.D. scholars. BCSIR comprises of three multidisciplinary regional laboratories in Dhaka, Chittagong and Rajshahi,

as well as seven mono-disciplinary institutes. These include: Institute of Fuel Research & Development (IFRD); Institute of Food Science & Technology (IFST); Institute of Glass and Ceramic Research & Testing (IGCRT); Leather Research Institute (LRI); Institute of Mining, Mineralogy and Metallurgy (IMMM); Pilot Plant and Process Development Centre (PP&PDC); and Reference Institute for Chemical Measurements.

### **Other Key Research Centres of Bangladesh are listed as follows:**

- International Centre for Diarrhoeal Disease Research Bangladesh (Centre for Health and Population Research)
- Bangladesh Rice Research Institute
- Bangladesh Agricultural Research Institute
- Bangladesh Livestock Research Institute
- Bangladesh Institute of Nuclear Agriculture
- Bangladesh Agricultural Research Council
- Bangladesh Fisheries Research Institute
- Bangladesh Sugarcane Research Institute
- Soil Resources Development Institute
- Bangladesh Forest Research Institute
- Geological Survey of Bangladesh
- Bangladesh Medical Research Council

Source: <https://research.webometrics.info/en/asia/bangladesh%20>

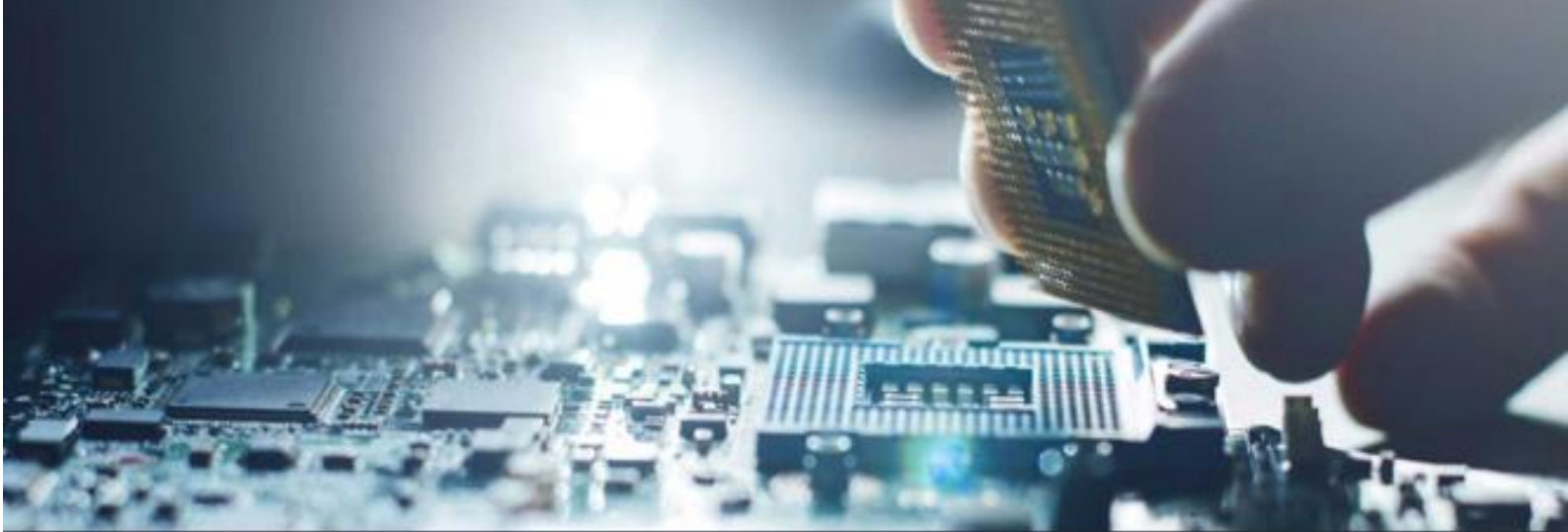


Infectious Diseases Institute



Oceanography Institute

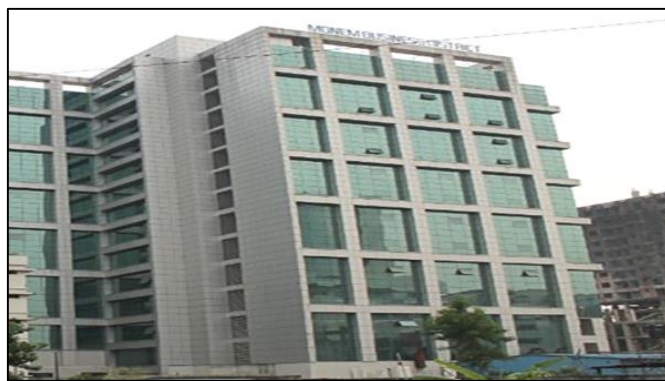




## D. RESEARCH AND DEVELOPMENT

### ❖ Gross Expenditure on Research and Development as a percentage of GDP (GERD)

Current figures for Bangladesh's GERD are not available. The latest data available are for the year 2015 where Bangladesh spent 0.3% of its GDP in research and development. While this is very low from the international average GERD of 1.7%, it is noted that in the South Asian region only India spends more than 0.3% (0.7%) of its GDP on R&D. Other South Asian countries (except Bangladesh and Nepal) are spending even less than 0.3%. Bangladesh has been focusing on meeting the essential needs of its 160 million people as a basic priority. This has not left the government with sufficient surplus resources to support R&D. The business sector also has not financed research to any significant extent.



An example of private sector supported R&D is the Samsung R&D Institute Bangladesh (SRBD) Started in 2011, it is located in the heart of Dhaka. It is the first ever R&D hub set up by a multinational company in



Bangladesh. SRBD is an integral part of a worldwide network of R&D centers set up by Samsung Electronics

## ❖ **R&D Focus**

### ➤ **Renewable Energy/Climate Change**

International financial flows to Bangladesh supporting clean energy R&D and renewable energy production increased by about 65% over the 2015–2019 period to US\$497 million. In July 2020, the Bangladesh North-West Power Generation Company entered into a US\$ 400 million joint venture with the China National Machinery Import and Export Corporation to develop about 500 MW of power from renewable sources by 2023.

The Ministry of Power, Energy and Mineral Resources has unveiled plans to create floating and rooftop solar power plants to overcome the shortage of available land. A project implemented by the Bangladesh Rural Electrification Board has introduced solar-powered irrigation pumps at eight locations at a cost of about US\$ 1.3 million. This project has been financed by the Bangladesh Climate Change Trust Fund (2010), which the government has endowed with US\$ 390 million. The latest ten-year Bangladesh Climate Change Strategy and Action Plan dates from 2018.

Source: *UNESCO Science Report 2021*

### ➤ **Agriculture**

The research and development activity in the agriculture sector is essentially confined to a few crops of which rice is the most important, followed by tea, jute, wheat and pulses. On rice research, the **Bangladesh Rice Research Institute (BRRI)**, an organisation that has worked closely with the International Rice Research Institute (IRRI) in the Philippines, has been very active over the past decades. A total of 36 varieties developed by BRRI are in use at the level of the farmers and newer varieties are now at various advanced stages of development, including the development of hybrid rice.



BRRI has been singularly responsible for the country's enhanced level of cereal production which is currently said to be at near self-sufficiency level. Future programmes are directed both to improved varieties including the presently popular 'hybrid rice' production technology along with research on management practices such as use of fertiliser, insecticide and pesticide, and proper irrigation technique.

### ➤ **ICT in Bangladesh**

Bangladesh has been working relentlessly to establish “**Digital Bangladesh**”, an integral part of the government’s Vision 2021. The results are beginning to be noticed:

The Information and Communications Technology (ICT) sector of the country has maintained 57.21 percent export growth on an average over the nine years (2009-2018). In the fiscal year (FY) 2016–17, Bangladesh ICT sector registered export earnings worth US\$0.8 billion from the global market and US\$1.54 billion from the domestic market span – thereby making around one percent contribution to the gross domestic product (GDP). The ICT sector has created around three hundred thousand job opportunities so far. ICT exports of the country are projected to reach US\$5 billion by 2025.



- Bangladesh IT/ITES industry is faring comparatively well by achieving US\$ 1.3 billion export earnings in FY 2020-21 and holding US\$ 1.4 billion equivalent market share in the local market contributing 0.76 per cent to the GDP creating more than 1 million employment opportunities so far.
- According to recent reports there are 8.5 million students learning from multimedia content developed by 100,000 teachers
- 105 Digital Talking text books for all visually disabled students
- 103 innovations incubated through Service Innovation Fund
- \$28.15 mil earnings for Digital Center Entrepreneurs
- Bangladesh Association of Software and Information Services (BASIS), which started its journey with 17 companies in 1997, now stands at 1200+ companies involved in software development and providing IT services.

#### ❖ **R&D Human Capital:**

- **Researchers per million inhabitants (FTE)**      **Data not available**
- **Researchers distribution by major fields (HC)**      **Data not available**
- **Researchers by major fields (HC)**      **Data not available**



## E. HIGHER EDUCATION

- Following is the list of national and global ranking of leading Bangladeshi universities:

University Name	National Ranking	Global Ranking
Bangladesh University of Engineering and Technology	1	1589
University of Dhaka	2	1668
Shahjalal University of Science & Technology	3	1815
North South University Bangladesh	4	2056
Rajshahi University	5	2076
Jahangirnagar University	6	2416
BRAC University	7	2427
Bangladesh Agricultural University	8	2659
University of Chittagong	9	2762
Daffodil International University	10	2902
Independent University Bangladesh	11	3143
Khulna University	12	3251

Source: <https://www.webometrics.info/en/Asia/Bangladesh%20>

- **Universities in Bangladesh** represent about 150 academic bodies of the conventional higher education institution (HEI). These include 43 public universities, 103 private universities, 3 international universities, 31 specialized colleges, and 2 special universities. There

are specialized universities in all categories offering courses principally in technological studies, medical studies, business studies and Islamic studies. There are two private universities dedicated solely to female students.

- Universities in Bangladesh are mainly categorized into three different types: public (government owned and subsidized), private (private sector owned universities), and international (operated and funded by international organizations such as the Organisation of Islamic Cooperation). Bangladeshi universities are affiliated with the University Grants Commission.
- Twenty-two universities have specialized curricula. Two of these are focused on Islamic studies, four on health science, six on agricultural science, six on engineering, one on textile engineering, one on Veterinary medicine, one on Aeronautical science, one on ocean science and one on women's studies.

There are three international universities in Bangladesh.

- International Culture University
- Islamic University of Technology, established by the Organization of Islamic Cooperation
- Asian University for Women, located in Chittagong division and funded by the Asian University for Women Support Foundation (AUWSF).

### ❖ **Science and Technology Universities:**

Shahjalal University of Science and Technology
Hajee Mohammad Danesh Science & Technology University
Mawlana Bhashani Science and Technology University
Patuakhali Science and Technology University
Islamic University of Technology
Noakhali Science and Technology University
Jashore University of Science and Technology
Pabna University of Science and Technology
Bangabandhu Sheikh Mujibur Rahman Science and Technology University
Rangamati Science and Technology University



Bangamata Sheikh Fojilatunnesa Mujib Science & Technology University
Chandpur Science and Technology University
Sunamganj Science and Technology University
Bogura Science and Technology University
Lakshmipur Science and Technology University

## ❖ Technical and Vocational Education

**The technical and vocational education system** provides courses related to various applied and practical areas of science, technology and engineering, or focuses on a specific specialized area. Course duration ranges from one month to four years. The Directorate of Technical Education (DTE) is responsible for the planning, development, and implementation of technical and vocational education in the country. Curriculum is implemented by BTEB. In the Technical Education System, after obtaining a Diploma-in-Engineering degree (four-year curriculum) from the institutes listed below, students can further pursue their educational career by obtaining a bachelor's degree from Engineering & Technology Universities.



Jessore Polytechnic Institute, Jessore



Bangladesh University of Engineering and Technology

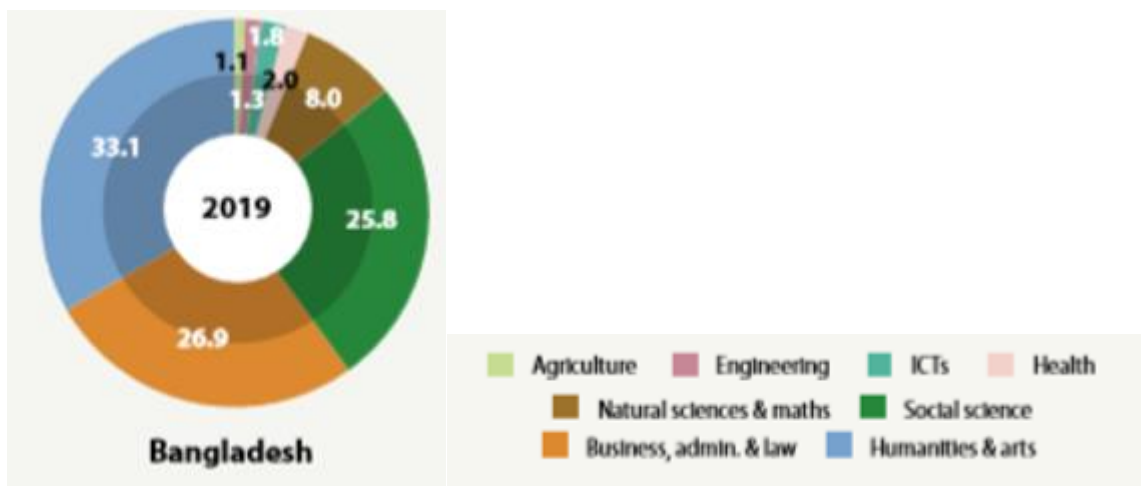
Following are the Technical and Vocational Institutions of Bangladesh:

- Bangladesh Sweden Polytechnic Institute
- Barisal Polytechnic Institute
- BCMC College of Engineering & Technology –
- Bogura Polytechnic Institute
- Brahmanbaria Polytechnic Institute
- Comilla Polytechnic Institute

- Chittagong Polytechnic Institute
- Dhaka Polytechnic Institute
- Feni Polytechnic Institute
- Graphic Arts Institute
- Jessore Polytechnic Institute
- Khulna Polytechnic Institute
- Kushtia Polytechnic Institute
- Mangrove Institute of Science and Technology
- Mymensingh Polytechnic Institute
- Patuakhali Polytechnic Institute
- Rajshahi Polytechnic Institute
- Sylhet Polytechnic Institute

❖ **Tertiary level enrolment in Bangladesh has risen from 13.9% in 2014 to 20.6% in 2018**

Distribution of tertiary graduates by programme in Bangladesh



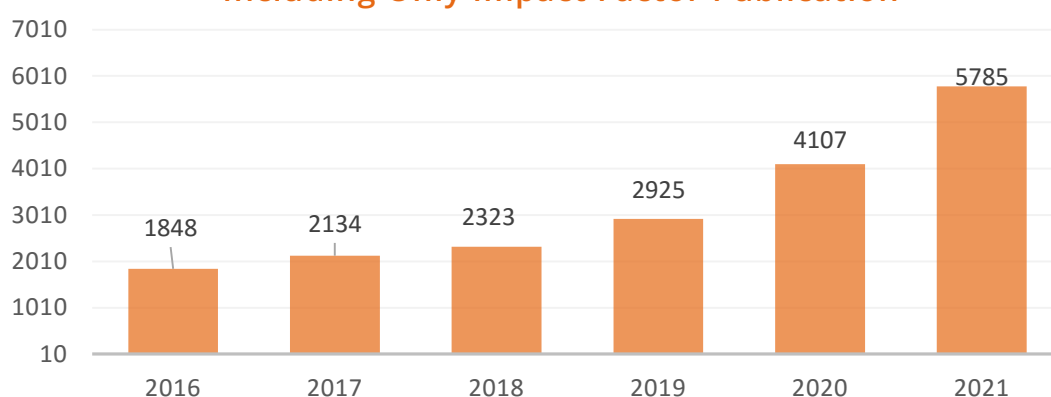
- Only a relatively small fraction (14.2%) of students were graduated in the sciences, engineering, ICTs, health, and agriculture, combined.
- The largest number of tertiary level graduates were in the fields of arts and humanities (33.1%).





## F. RESEARCH PUBLICATIONS

Research Publications (Science and Technology)  
Including Only Impact Factor Publication



Source: Web of Science Core Collection | Document type: Articles

Years

Bangladesh's scientific publications have steadily grown in number from 1848 in 2016 to 5785 in 2021, displaying an average increase of 42% per annum. The country ranks fourteenth within the OIC countries in terms of the number of scientific publications in refereed international journals.

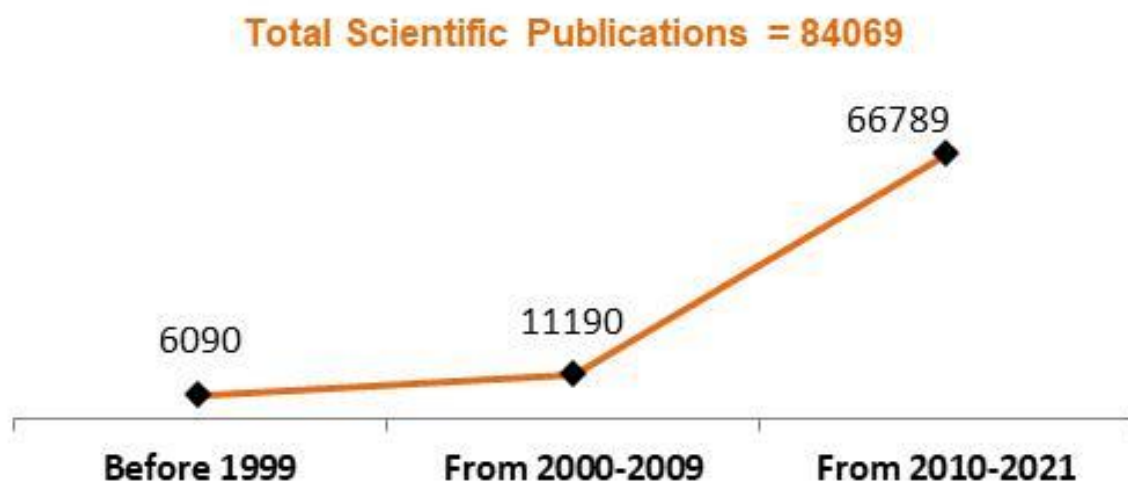
### ❖ Detailed Analysis of Publications:

The major aim of this part is to highlight the total research Scholarly Output (SO) of Bangladesh. We will focus on the last ten years (from 2012 to 2021) and will present;

1. The per year publications.
2. The quality of publications as described by the per year citations, citations per publications and field weighted citation impact.

3. The source or journal ranking used as an indicator for the quality of publications.
4. The number of papers in different subject areas.
5. Based on the number of publications, the top ten most productive universities.
6. The percent (%) international collaboration and the top ten collaborating countries with Bangladesh will be presented.

For this purpose, the Scopus (database) was employed. A total 84069 papers were published between over the full period. The highest documents (n=66789 or 79.45%) were published between 2010 to 2021. For a quick presentation we divided the total years in three eras. The data is presented in the figure.



1. Furthermore, the per year data of the last ten years i.e. from 2012 to 2021 is presented in the table. It contains, the number of publications or scholarly output (SO), citations, and citations per publications (CPP) of 61828 documents (as shown in the table).
2. The highest documents are published in 2021 (n=13108), followed by 2020 (n=9172) and 2019 (n=8351).
3. The total number of citations over this period was 859408, or the CPP was 14.
4. Article Field Weighted Citation Impact (FWCI) is another indicator which can be used to present the quality of papers. It “indicates how

the number of citations received by an article compares to the average or expected number of citations received by other similar publications". The total FWCI was found to be 1.35 which indicates that the articles received 35 % higher citations as compared with global average.

**Table No. 1**

S#	Title	Overall	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Scholarly Output	61428	3440	3442	4181	3925	4491	5470	5848	8351	9172	13108
2	Citations	859408	56583	64627	79040	86831	91914	106031	96001	93569	106990	77822
3	Citations per Publication	14	16.4	18.8	18.9	22.1	20.5	19.4	16.4	11.2	11.7	5.9
4	Field-Weighted Citation Impact	1.35	0.77	0.99	1.15	1.27	1.41	1.37	1.47	1.34	1.43	1.55

- The quality of journals can be used as a metrix for the quality of research. For the purpose, Scopus has categorized all journals in seven quartile (Q) groups (from Q1 to Q7). For example, Q1 is occupied by the top 1%, and Q7 is occupied by journals in the 75 to 100% group. The per year publications details in different quartile groups are presented in the table no. 2.

**Table No. 2**

S#	Title	Overall	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Pub in top 1% Sources (Q1)	818	30	46	56	63	76	90	84	96	115	162
2	Pub in top 5% Sources(Q2)	3918	167	181	249	232	286	370	368	468	649	948
3	Pub in top 10% Sources(Q3)	8140	321	348	399	458	561	785	855	984	1405	2024
4	Pub in top 25% Sources(Q4)	17520	719	789	919	1006	1175	1465	1651	2050	3018	4728
5	Pub in top 50% Sources(Q5)	29289	1305	1441	1745	1805	2058	2415	2706	3375	4857	7582
6	Pub in top 75% Sources(Q6)	37579	1764	2040	2333	2384	2638	3161	3449	4369	6160	9281

7	Pub in top 100% Sources(Q7)	43833	2256	2561	2812	2937	3060	3707	4017	5106	7026	10351
---	-----------------------------	-------	------	------	------	------	------	------	------	------	------	-------

Or in the figure the overall percentage of publications in Q-groups are described. For example, the highest documents are published in Q5, followed by Q4 and Q6.



### For the period 2012 - 2021

- We also described the number of publications in twenty-seven (n=27) major subject areas. The highest number of documents were published in;
  1. Engineering (n=16998)
  2. Computer Science (n=15832) and
  3. Medicine (n=12935)
- The highest citations were recorded for;
  1. Medicine (n=292021)
  2. Engineering (n=141915) and
  3. Environmental Science (n=125791)

**Table No. 3** (2012 to 2021)

S#	Subject Area	SO	Citations	Authors	CPP	FWCI
1	Engineering	16998	141915	21090	8.3	1.24
2	Computer Science	15832	102775	20470	6.5	1.18
3	Medicine	12935	292021	18409	22.6	2.08
4	Agricultural and Biological Sciences	8028	103739	10983	12.9	1.11
5	Physics and Astronomy	7817	74374	9985	9.5	1.15
6	Environmental Science	6769	125791	9276	18.6	1.38
7	Social Sciences	5624	51452	7632	9.1	1.25

8	Biochemistry, Genetics and Molecular Biology	5396	97223	8596	18	1.2
9	Materials Science	5381	67629	7005	12.6	1.29
10	Energy	4755	52006	8454	10.9	1.31
11	Mathematics	3984	25533	7053	6.4	1.3
12	Chemistry	3228	61532	4336	19.1	1.24
13	Chemical Engineering	2516	40327	4179	16	1.35
14	Immunology and Microbiology	2314	39713	4177	17.2	1.28
15	Business, Management and Accounting	2299	23970	2794	10.4	1.12
16	Pharmacology, Toxicology and Pharmaceutics	2260	32249	4407	14.3	1.01
17	Earth and Planetary Sciences	2243	30542	3169	13.6	1.19
18	Decision Sciences	2140	11824	4470	5.5	1.24
19	Multidisciplinary	1866	47977	4419	25.7	1.14
20	Economics, Econometrics and Finance	1671	15993	1967	9.6	1.21
21	Veterinary	913	8179	1855	9	1.29
22	Arts and Humanities	778	4378	1066	5.6	1.23
23	Nursing	773	10869	1478	14.1	1.21
24	Psychology	526	8222	909	15.6	1.97
25	Neuroscience	496	11153	868	22.5	1.75
26	Health Professions	275	3041	649	11.1	1.22
27	Dentistry	62	315	117	5.1	0.64

*NOTE: The total scholarly (SO) may be different from the sum of the publications (sorted according to journal classification) because the same publication may be appearing under various classification, concurrently.*

The number of authors, citations per paper (CPP) and Field Weighted Citation Impact (FWCI) for all 27 areas are described in the preceding table no.4.

**Table No.4**

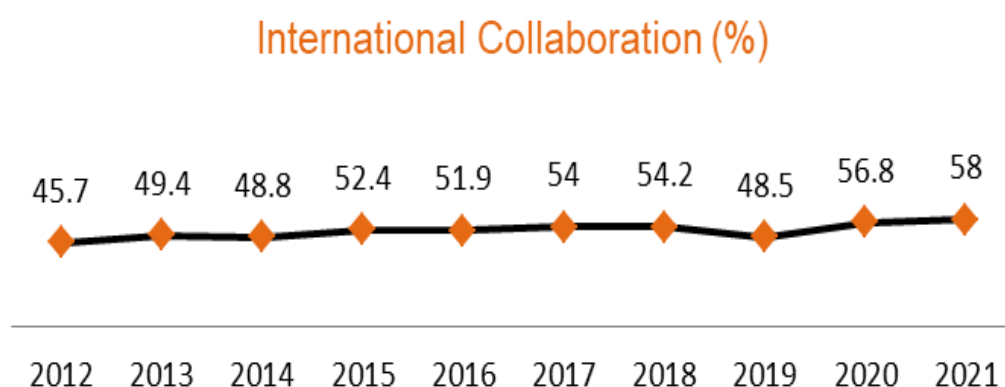
S#	Institution	SO	Citations	Authors	CPP	FWCI
1	University of Dhaka	6427	100937	4423	15.7	1.47
2	Bangladesh University of Engineering and Technology	5883	58177	4148	9.9	1.03
3	Rajshahi University	3544	43142	2516	12.2	1.22
4	International Centre for Diarrhoeal Disease Research Bangladesh	3374	155718	1812	46.2	3.61
5	Jahangirnagar University	2794	39907	1746	14.3	1.47
6	Bangladesh Agricultural University	2458	39209	1707	16	1.08
7	University of Chittagong	2206	26560	1543	12	1.23
8	North South University	2149	22822	2339	10.6	1.45
9	BRAC University	2119	89031	2167	42	3.91
10	Khulna University of Engineering and Technology	2065	16443	1713	8	1.12



The list of top ten most productive universities is provided in the table no.4. The highest documents are published by

1. University of Dhaka (n=6427)
2. Bangladesh University of Engineering and Technology (n=5883) and
3. Rajshahi University (n=3544)

For each university the total number of citations, number of contributing authors, CPP and FWCI are also provided in the table.



Bangladesh has published 53.2% documents in strong international collaboration. The rate of per year collaboration (from 2012 to 2021) is presented in the figure.



The data of the top ten collaborating countries is presented in the figure. The highest documents were published in collaboration with

1. USA (n=10071),
2. Japan (n=7530) and
3. Australia (n=6275).



## G. International Cooperation and Support Initiatives (selected)

### ❖ **Some International Cooperation Agreements**

- **South Korea, Bangladesh MoU on scientific and tech cooperation.** The Ministry of Science and ICT of the Republic of Korea and the Ministry of Science and Technology of the People's Republic of Bangladesh signed a Memorandum of Understanding (MoU) on scientific and technological cooperation on December 30, 2021. The MOU was signed to strengthen the implementation of the two governments' Agreement on Scientific and Technological Cooperation, which was signed in May 1995. The MOU specifies a number of areas and types of cooperation, including the formation of a Joint Committee.
- **Government of the Republic of Belarus and the Government of the People's Republic of Bangladesh:** In 2012, an Agreement between the Government of the Republic of Belarus and the Government of the People's Republic of Bangladesh on Cooperation in Science and Technology and a Memorandum of Understanding between the National Academy of Sciences of Belarus and the Bangladeshi Academy of Sciences on Scientific and Technical Cooperation were signed. A Joint Belarusian-Bangladeshi Commission for

Cooperation in Science and Technology is functioning since then. The Bangladeshi Side is considering the possibility of cooperation with the residents of the High-Tech Park in Minsk and in medical startups by HTP residents, primarily in the field of telemedicine, as well as medical solutions based on artificial intelligence performed by Belarusian developers.

Source: [https://india.mfa.gov.by/en/bilateral\\_relation/bang/tec/](https://india.mfa.gov.by/en/bilateral_relation/bang/tec/)

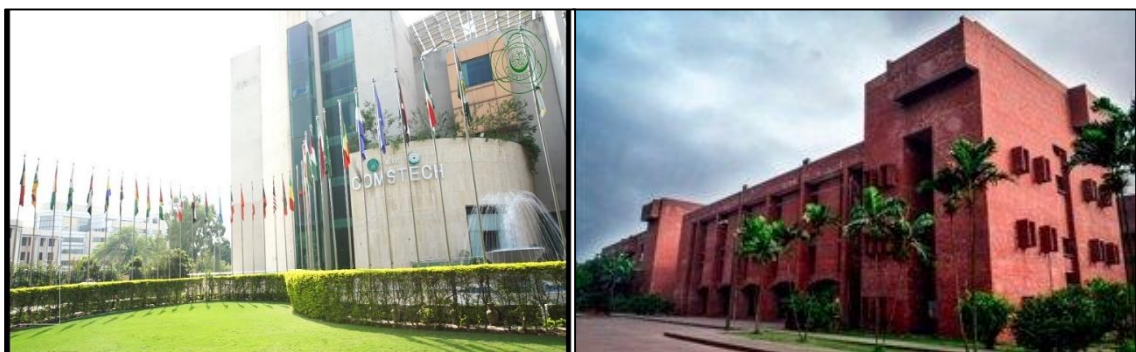
- **Bangladesh (GoB) and the Government of the United States of America (USA):** A joint Agreement on Science and Technology was signed by the Government of the People's Republic of Bangladesh (GoB) and the Government of the United States of America (USA) in 2001 for creation of an Endowment Fund for Applied Research in Natural Sciences focused on Food Security. The joint agreement was later amended and according to the amended Agreement signed on 13 April 2005, the GoB will use monetized proceeds to fund for the establishment of the BAS-USDA Endowment for Applied Research in the Natural Sciences.

#### ❖ **Cooperation with International Scientific Institutions:**

- Since 2015, the BCSIR has signed memoranda of understanding with India's Council of Scientific and Industrial Research, Australia's Commonwealth Scientific and Industrial Research Organization and the Japan Development Corporation. The agreement with the latter (2018), focuses on improving soil quality at construction sites and the safety of drinking water in arsenic prone areas.



- In 2014 CERN and Bangladesh signed an International Cooperation Agreement (ICA) for the development of the cooperation in particle physics research, technology and education. As a result of these early developments students from Bangladesh participate in the CERN Non-Member State Summer Student Programme and a research group from the University of Dhaka has been working with ISOLDE, while universities in Bangladesh are planning to join a research activity at the Light Hadron Collider (LHC).
- **Islamic University of Technology (IUT) Bangladesh Cooperation with OIC/COMSTECH:** “Islamic University of Technology” at Dhaka, Bangladesh commonly known as IUT is a subsidiary organ of the Organization of the Islamic Conference (OIC), representing fifty-seven member countries from Asia, Africa, Europe and South America. COMSTECH and IUT signed a MoU on 22 March 2022. Under this, IUT became a Member of COMSTECH Consortium of Excellence (CCoE) initiative, and cooperates with COMSTECH on various programmes of trainings, exchange of researchers, and award of Fellowships.





INNOVATION

## H. INNOVATION, ENTREPRENEURSHIP & TECHNOLOGY PARKS

### ❖ **Government Policies to Promote Innovation and its Eco-System**

- **National ICT Policy:** The Government of Bangladesh deployed the National ICT Policy in 2009 to become Digital Bangladesh by 2021. Government policies and projects from the ICT Ministry, such as IDEA Project and Startup Bangladesh Limited with 500 crore BDT (\$ 65 Million) funds, are taken to improve the local startup ecosystem. Additionally, the government plans setting up 28+ Hi-Tech Parks, including infrastructure support like data centers, to support technology companies.
- In 2010, **the Bangladesh Economic Zones Authority (BEZA) and Bangladesh High-Tech Park Authority (BHTPA)** were established by two separate acts of parliament to develop related infrastructure. BEZA has been authorized to establish 88 special economic zones, according to its official website. Of the 88 special economic zones, 29 will be privately managed. The first of these, the Meghna Special Economic Zone, has been operational since March 2018. A number of special economic zones have been earmarked for country specific investment, such as by China, India or Japan.



- **Bangladesh's Own SMEs Policy (2019)** recognizes the need to give SMEs greater access to finance, markets, technology and innovation. This policy will be supported by the new Bangladesh Engineering Research Council for the commercialization of research results and adaptation of imported technology established by law in September 2020 as an outcome of the National Science and Technology Policy (2011).
- **The Access to Information (a2i) Act:** The Access to Information (a2i) programme bills itself as the flagship of the Digital Bangladesh agenda. Initially designed to digitize government services, further to the Right to Information Act (2009), its focus has expanded over the past decade to include the promotion of social innovation, pro-poor FinTech and youth skills (UNDP, 2019). In 2017, it set up an innovation lab. The a2i programme is run by the Prime Minister's office, with support from the United Nations Development Programme (UNDP) and United States Agency for International Development (USAID).
- **Citizen Entrepreneurs:** (Digital centres run by 'citizen entrepreneurs'). One of the programme's main achievements has been the 5875 digital centres dotted across the country which offer government services and information to rural and underserved communities. Visitors can access land records and mobile financial and insurance services, renew their passport and follow online training courses, among other services. Each digital centre is co-run by 'citizen entrepreneurs' and local representatives who reportedly serve 5–6 million clients, on average (UNDP, 2019).
- **The Bangladesh Entrepreneurship Ecosystem** is at an inflection point with an excess of US \$ 330 million accumulated over the last decade in international investments from big-name corporate investors and venture capitals investing in industries like FinTech, Logistics, and Mobility over the last five years. The emergence of active Angel Investment Networks, Impact Investing, host of local and international operating accelerators/ incubators propelled 1,200+ active Startups, generating 1.5 million+ employment embracing

products and services of Startups as part of the country's everyday life. Additionally, B-SEC (Bangladesh Securities and Exchange Commission) has also approved small-cap stock exchange guidelines, which is a big step towards providing investors with Startup exits.

- **Green Transformation Fund:** Entities seeking to import machinery and other accessories for initiatives with an environmental focus, such as waste management, water conservation or energy efficiency, can now access the Green Transformation Fund managed by the national central bank, Bangladesh Bank. In 2019, the bank enlarged the scope of the US\$ 200 million fund beyond the textiles, leather and jute industries to encompass all manufacturing and export-oriented entities.

## ❖ a2i Innovation Lab

Established in 2017, the a2i Innovation Lab (or iLab) provides innovators with seed funding from the a2i Innovation Fund, as well as access to a Maker Lab and mentorship from industry experts. It also helps innovators to protect their intellectual property through copyright and patent filing.



As of September 2020, 247 projects had received funding for a total of US\$ 4.5 million, resulting in 14 commercialized products.

In order to benefit from the fund, potential innovators submit their ideas through an online Idea Bank. Once an idea has been selected, the innovator is given the means to develop a prototype with technical guidance from a panel of mentors. The maximum amount awarded is BDT 2.5 million (ca US\$ 29 600).

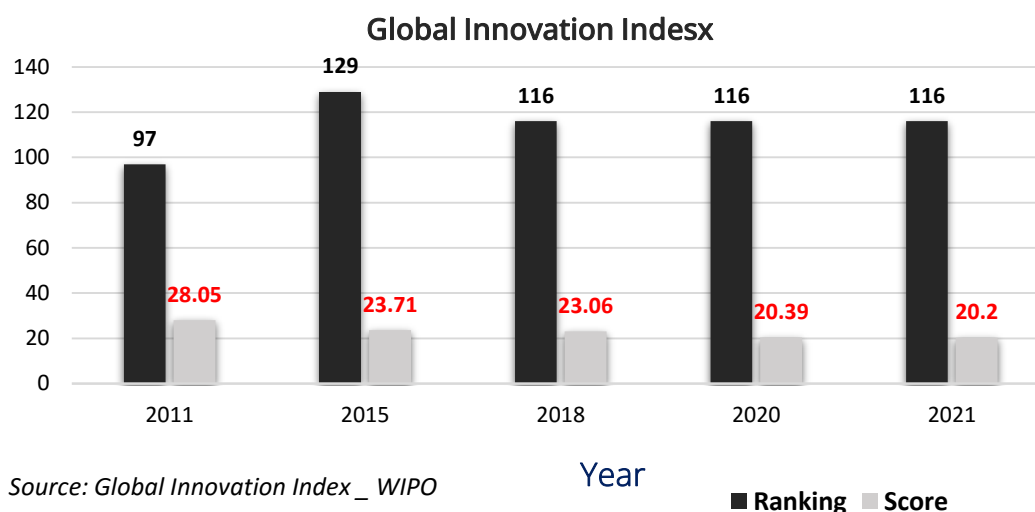
The iLab also hosts two competitions geared towards solving national challenges through innovation, the Challenge Fund and Innov-A-thon. Under the Challenge Fund, the iLab launches a call for proposals to solve a specific problem, inviting participants to submit their ideas online for a maximum grant of BDT 2.5 million.

A joint initiative of the government and UNDP, the iLab has established partnerships with numerous public and private Bangladeshi universities.

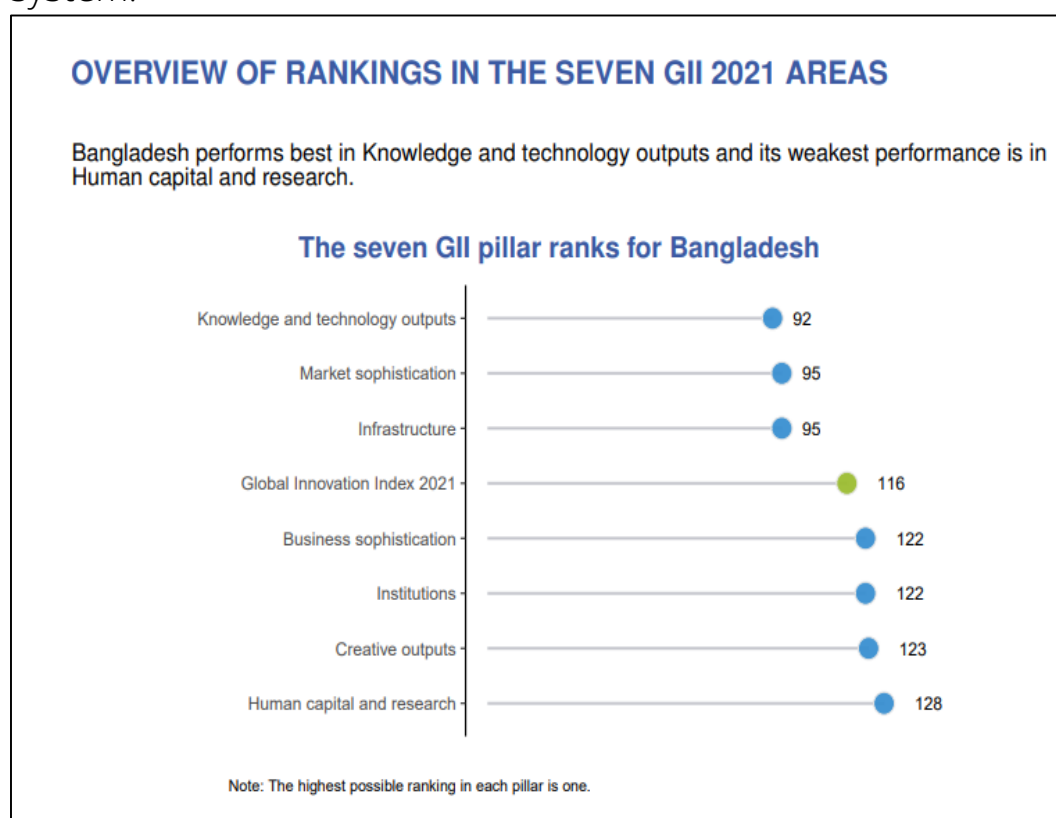
Source: UNESCO Science Report 2021 and <https://a2i.gov.bd/innovation-fund/>

Source: [https://www.wipo.int/ipstats/en/statistics/country\\_profile/profile.jsp?code=BD](https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=BD)

## ❖ Global Innovation Index



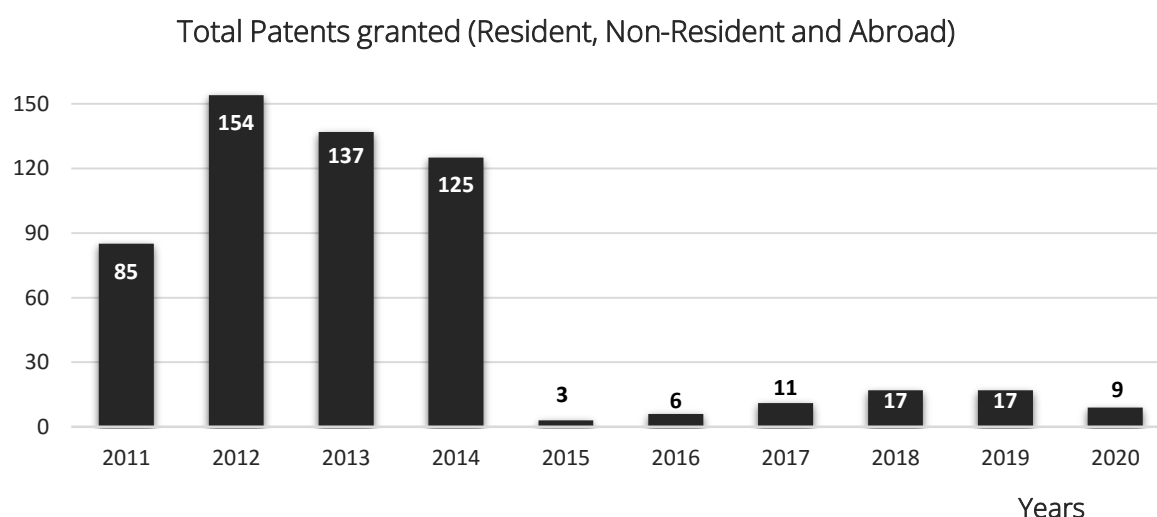
The Global Innovation Index, a measure of the innovation ecosystem inputs and outputs of a country, ranks Bangladesh at 116 in 2021 which has improved from 129 in 2015. Within the OIC countries its rank in the GII index is 27. Its GII score has declined slightly since 2015 from 23.71 to 20.7 reflecting difficulties in improving the innovation and enterprise eco-system.



Source: Global Innovation Index - WIPO

A detailed look at the various pillars that constitute the GII indicates that Bangladesh performs best in knowledge and technology outputs and its weakest performance is in human capital and research. This clearly indicates a need for Bangladesh to invest more strongly in developing its human capital and in R&D.

## ❖ Patents Awards



Source: WIPO: [https://www.wipo.int/ipstats/en/statistics/country\\_profile/profile.jsp?code=BD](https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=BD)

Bangladesh's lack of local R&D and innovations resulting in weaker indigenous commercialization is reflected in the data on granted patents. It is clear that the number is very limited and appears to have diminished significantly since 2014. Detailed data indicate that all of the recent patents granted fall in the category of abroad suggesting that they originate from Bangladesh is working outside.

Total Patents granted (Resident, Non-Resident and Abroad)

Year	Resident	Non-Resident	Abroad	TOTAL
2011	6	79	-	85
2012	14	139	1	154
2013	16	118	3	137
2014	21	100	4	125
2015	-	-	3	3
2016	-	-	6	6
2017	-	-	11	11
2018	-	-	17	17
2019	-	-	17	17
2020	-	-	9	9

Source: WIPO: [https://www.wipo.int/ipstats/en/statistics/country\\_profile/profile.jsp?code=BD](https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=BD)

## ❖ Technology Parks and Incubation Centres

Bangladesh Hi-Tech Park Authority (BHTPA) is establishing Hi-Tech Park, Software Technology Park and IT Training & Incubation Centre throughout the country to attract the local and foreign investors for the development of Hi-Tech/ IT/ITES industries. Bangladesh Hi-Tech Park Authority has set up **28 (eighty)** Hi-Tech Parks (HTP) / Software Technology Parks (STP) / IT Training and Incubation Centers across the country.

- Information technology, Software Technology, Bio-Technology, Renewable Energy, Green Technology, IT Hardware, IT Enabled Services and R&D etc. are major areas of investment in HiTech industry in Bangladesh.
- The following Parks were already in operation in 2019-20:
  1. *Bangabandhu Hi-Tech City*, Kaliakoir, Kaliakoir, Upazila, Gazipur
  2. *Sheikh Hasina Software Technology Park*, SadorUpazila, Jashore
  3. *Software Technology Park, Janata Tower*, Karwan Bazar, Dhaka



A megaproject to set up 12 hi-tech parks in Dhaka and other districts is underway. The construction of eight of these parks was scheduled to begin in February 2022. Under the Bangladesh-Bharat Digital Service and Employment Training (BDSET) Centre project, the government will set up six specialised labs at software technology parks, high-tech parks and Sheikh Kamal IT Training and Incubation Centre to provide training.

The project is being implemented at Kaliakair in Dhaka, Rajshahi, Natore, Chattogram, Jashore and Khulna at a cost of over Tk61 crore. The parks under construction are:

1. Bangabandhu Sheikh Mujib Hi-Tech Park, Rajshahi, Rajshahi City Corporation



2. Hi-Tech Park, Sylhet (Sylhet Electronics City) Companiganj, Sylhet
3. Sheikh Kamal IT Training and Incubation Centre, Natore
4. IT/Hi -Tech Park at District Level (12 district)
5. IT Business and Incubation Centre, Chattogram University of Engineering and Technology (CUET)
6. IT Business and Incubation Centre, Rajshahi, Rajshahi City Corporation
7. ICT Incubator Cum Training Cente, KUET, Khulna University of Engineering and Technology

Source: [http://bhttpa.portal.gov.bd/sites/default/files/files/bhttpa.portal.gov.bd/page/3a285300\\_1a27\\_4933\\_82c4\\_de868a390ad7/Park%20Info%20%28English%29.pdf](http://bhttpa.portal.gov.bd/sites/default/files/files/bhttpa.portal.gov.bd/page/3a285300_1a27_4933_82c4_de868a390ad7/Park%20Info%20%28English%29.pdf)

- By 2020, the established parks had received an investment of about BTD 327 crore (ca US\$ 39 million) and generated revenue of BTD 24 crore (ca US\$ 3 million).



- The Active Pharmaceutical Ingredients Industrial Park at Munshiganj is expected to be operational by 2023 according to the president of the Bangladesh Association of Pharmaceutical Industries. Once up and running, the park will enable companies to produce the main chemical components of pharmaceutical drugs. This should lower the cost of domestic drugs and boost their international competitiveness.

Source: [http://bhttpa.portal.gov.bd/sites/default/files/files/bhttpa.portal.gov.bd/page/3a285300\\_1a27\\_4933\\_82c4\\_de868a390ad7/Park%20Info%20%28English%29.pdf](http://bhttpa.portal.gov.bd/sites/default/files/files/bhttpa.portal.gov.bd/page/3a285300_1a27_4933_82c4_de868a390ad7/Park%20Info%20%28English%29.pdf)



## I. COMBATING THE COVID-19 PANDEMIC

### ❖ State Response to Crisis

- The COVID-19 global pandemic provided a strong impetus to develop the “National Preparedness and Response Plan for COVID-19”, as well as a national guideline on IPC for both private and public health care facilities. Since 2020, multi-sectoral and multi-stakeholder cooperation rapidly scaled up the implementation of IPC due to continued top level political and leadership commitment.
- **IPC monitoring/audit and feedback in the spirit of improvement:** The government health sector, together with WHO, has also developed assessment tools and checklists to monitor IPC standards, using a monthly scorecard to enable the visualization of IPC implementation by each health care facility. First piloted in Cox’s Bazar, this programme has led to improvements in 120 health care facilities, which were assessed regarding their IPC preparedness and readiness.
- **COVID-19 Emergency Response and Pandemic Preparedness Project With World Bank Support.**  
The government organized the project to provide:
  - Liquid medical oxygen system at 30 public hospitals across the country, which is vital for treating COVID-19 cases
  - 300 ventilators installed at public hospitals

- 220 beds set-up for the intensive care unit at the Dhaka North City Corporation COVID-19 Dedicated Hospital.
- The financing also made available large quantities of personal protective equipment for the frontline workers and COVID-19 testing machines and kits used by laboratories dealing with COVID-19 samples.

➤ **Government of Bangladesh's Response to COVID-19 for Education Sector:** To engage school level students through distant learning mechanisms, the Government of Bangladesh (GoB) took some quick initiatives.

- Four working groups were established to develop remote learning content and roll out lessons through four platforms: Electronic Media Platform, Mobile Platform, Radio Platform and Internet Platform.
- Government, Development Partners, and NGO entities worked together in each working group to produce and facilitate remote learning contents to reach a maximum number of students.
- The Electronic Media Platform became operational through Television broadcasting of prerecorded lessons for preprimary to primary grades.
- The state-run 'Shangshad Bangladesh Television started broadcasting this content for both secondary and primary sectors.
- During the program 'Ghore Bose Shikhi' (Learning from Home), lessons are being delivered on every subject for 20 minutes from 2pm to 4pm every day. At the secondary level, 10 classes per day are televised on secondary general education, allocating 20 minutes for each class. Classes have also started on technical and Madrasa based education.

➤ **Transformation of the national information hotline 333:** The national information hotline 333 was repurposed first into a platform for self-reporting COVID-19 symptoms. Then again as a platform enabling telemedicine services, which functioned as an Uber Pool-like system with close to 4,000 doctors; then again to identify the beneficiaries for urgent food relief; and then to shape [p-commerce](#), which is e-commerce over phone; and finally as a means to deliver



audio lessons to primary and secondary school students — all of this free of charge. 333 evolved into the country's largest telemedicine service with 4,000 doctors providing services pro bono.

- **Digital technology ensures food supply in rural Bangladesh during COVID-19:** The COVID-19 pandemic impacted food supply chains in Bangladesh, especially in the informal and unorganized sector in rural areas. 'virtual call center' helping connect rural farmers with suppliers and buyers. Farmer members call on a given mobile phone to place orders for seeds and fertilizer and to sell their produce including rice, vegetables, milk and fish. Single-person rickshaw vans transport the aggregated goods, and payments are made through mobile transfers, substantially reducing the risk of transmitting the coronavirus.
- **E-Generation Partners with Bangladesh Government to Fight Pandemic with Technology:** e-Generation, one of the leading IT companies in Bangladesh, has been working since the beginning of the pandemic to help strengthen the economy and society by offering various technological tools and solutions to fight the impact of coronavirus. These include:
- **Initiating 'Shohojoddha - A Plasma Network' with Government:** 'Shohojoddha', a plasma network, was initiated by eGeneration with the ICT Division of Government of Bangladesh, Directorate General of Health Services (DGHS) and a2i Innovation Lab to save the lives of critical COVID-19 patients by facilitating the



collection and distribution of convalescent plasma from patients who had recovered from the disease.

- **Integrating Healthcare with Emerging Technologies to Fight COVID-19:** e-Generation developed an AI-based chatbot, an X-ray image analysis tool based on machine learning, ICU over the Cloud, telemedicine and teleradiology solutions which are specifically geared towards improving and accelerating the detection and treatment of coronavirus infection. Recently, the company helped automate five hospitals of Border Guard Bangladesh with 500 beds through its self-developed Hospital Management Information System.

Source: <https://www.prnewswire.com/in/news-releases/egeneration-partners-with-bangladesh-government-to-fight-pandemic-with-technology-815919994.html>

### ❖ **Local Innovations to Combat COVID-19**

- **Locally developed low-cost coronavirus (Covid-19) testing kit).** The Government of Bangladesh has approved the production of a locally produced low cost testing kit to tackle the pandemic. Public health organisation Gono Shasthaya Kendra that runs hospitals and medical research work in the country developed the kit, which requires some chemical reagents that need to be imported.
- **Mobile Testing Solution:** A Concern-led consortium, designed to improved essential healthcare for disadvantaged communities, has moved quickly to come up with a simple and effective screening solution in the face of the pandemic.

It's an all-in-one mobile diagnosis and sample collection service, and it may well become the frontline for tackling the coronavirus in Bangladesh. Patients arriving at the mobile center receive free masks and hand sanitizer and are directed to a call booth, for consultation with a Doctor via video call. If the patient is suspected of having COVID-19 symptoms, they are registered and referred to the sample collection booth.

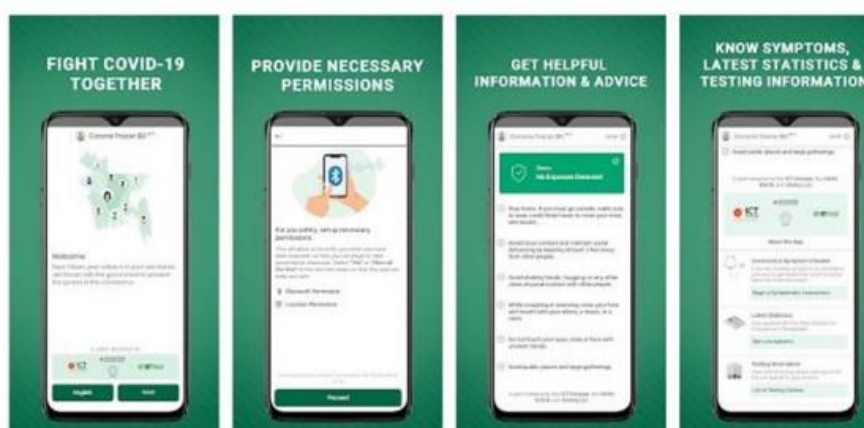
### ❖ **Digital Solutions**

- **Boithak:** This is a companion app for the Boithok platform, a web-based video conferencing platform. The app is based on a zoom online



meeting platform. The book is hosted in the National Data centre of Bangladesh Computer Council (BCC). And it's maintained by the BNDA team. This platform lets users share their necessities and feelings through perfect instant secure video conferencing that creates an accurate virtual meeting scenario. This platform is entirely secure, and users' data are entirely safe.

- **Surokkha App:** To distribute the COVID-19 vaccine among the people of Bangladesh, the ICT Division of Bangladesh has come up with a web portal and mobile application to proceed with the initial registration process. Surokkha provides the facility to register for vaccination for the people of Bangladesh.
- **Live COVID-19 Test:** This is an extensive data analysis tool where the users will be able to take a 30-seconds quiz to answer questions that will determine the susceptibility of Coronavirus in Bangladesh. The objective of this tool is to have a bird' eye view of the status of the whole country, generate a considerable amount of data that was analysed to make strategic decisions.
- **Hello Doctor:** Hello Doctor is an innovative mobile application to get medical consultancy. It helps by Telemedicine to make a video call to doctor to get medical consultancy. Appointments: Get an appointment with experienced Doctors anywhere, 24/7. E-prescription: Get your prescription in your app and through SMS. Medicine Reminder: Track your medicines and get reminders every time.



- **Corona Tracer:** Corona Tracer-BD is an initiative by the ICT Division and DGHS to bring the people of Bangladesh together in the combined fight against COVID-19.

This app utilizes a Bluetooth signal to understand if you are near another Tracer app user. It will help you identify whether you are at risk of COVID-19 infection by checking if you have been in recent contact with an infected individual. If your case seems risky, you will be able to seek medical help at the earliest and go into self-isolation.

- **BSMMU-a2i Specialized Telehealth Centre:** To ensure the provision of regular healthcare services, the Bangabandhu Sheikh Mujib Medical University (BSMMU), in collaboration with ICT Division, launched the BSMMU-a2i Specialized Telehealth Centre (09611677777) to provide medical advice to citizens of the country through video and audio calls. By this platform, all citizens of Bangladesh may get medical suggestions and information.

Source: [Dey et al in Health Informatics, Vol.11, No.1, February 2022](#)





**COMSTECH Secretariat**  
**33 - Constitution Avenue**  
**G-5/2, Islamabad - 44000**  
**Islamic Republic of Pakistan**

**Tele: 92-51-9220681-3**  
**Fax: 92-51-9211115, 9205264**  
**[www.comstech.org](http://www.comstech.org)**

**Compiled in 2023**