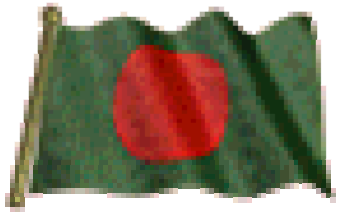


Programmes and Activities of

Bangladesh Council of Scientific and Industrial Research (BCSIR)

15th Meeting of the COMSATS Coordinating Council

TÜBITAK Marmara Research Center (MRC), Turkey, 24-25 May 2012

Prof. Dr. A. I. Mustafa

Chairman, BCSIR

Ministry of Science and Technology

Govt. of the People's Republic of Bangladesh

Establishment history of BCSIR

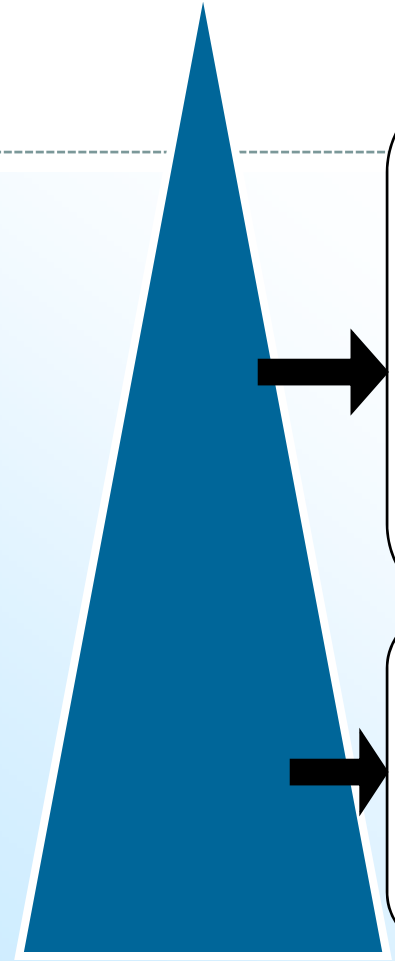
❶ Established in 1955 as the “East Regional Laboratories” of PCSIR.

❷ After the liberation of Bangladesh, BCSIR came into being on 16 November 1973 on the basis of a Cabinet Resolution.

❸ In 1978, BCSIR was re-constructed as an autonomous body.

❹ At present BCSIR is functioning under the Ministry of Science and Technology, Govt. of the People’s Republic of Bangladesh.

Management of BCSIR



The functions of BCSIR are being conducted under the overall control and supervision of the **Chairman** along with **four full time members** who are to assist the Chairman providing general guides to, and overseeing the activities of the Council.

The Council is governed by the **BCSIR Board** and the policy formulation is made at the **Advisory Council.**

Mission of BCSIR

To carry out and guide scientific, industrial and technological research that optimizes the economic, environmental & societal benefits for the people of Bangladesh.

Functions of BCSIR

Being the largest public research institute (PRI) of Bangladesh, BCSIR is functioning as the **Centre of Excellence** giving emphasis on **"Applied research and development (R&D)". However,** the core functions of BCSIR include:

❶ Initiate, promote and guide scientific, industrial and technological research.

❷ Establish laboratories /institutes for furtherance of scientific and industrial research exploiting the natural resources of the country.

❸ Commercialize the research results.

❹ Offer fellowships to promote young scientists and students.

❺ Disseminate information of scientific, industrial and technological matters and publish scientific papers, reports.

❻ Encourage establishment of industrial research organizations.

❼ Expand research network at home and abroad.

❽ Provide analytical and consultancy services to enhance the revenue income.

❾ Establish public-private partnership through disseminating research results.

Key issues considered for R&D projects

The council is actively engaged in performing **R&D** projects which are usually prioritized considering the following issues:

(i) National demand and need;

(ii) Feasibility and market acceptability;

(iii) Importance in the applied field;

(iv) Suitability for the establishment of SME's; and

(v) Competitive sustainability.

Thrust R&D areas

At present **238 R&D** projects (including **20 short term priority projects**) are being carried out in the following fields:

- Analytical chemistry
- Biological science
- Biogas technology
- Bio-ceramics
- Building materials
- Chemical technology
- Chemical metrology
- Fibre and polymer
- Food science & technology
- Glass & ceramics
- Herbal medicine & natural products
- Industrial physics
- Leather technology
- Microbiology
- Mining, mineralogy & metallurgy
- Pharmacy
- Pilot plant & techno-economical study
- Pulp and paper
- Renewable energy
- Soil & environmental science

BCSIR Units

To face the challenges of 21st century, so far BCSIR has expanded its domain to 03 full fledged multi disciplinary regional laboratories, 05 mono disciplinary institutes and 01 centre for pilot plant studies.

BCSIR Units

Institute of Mining, Mineralogy & Metallurgy (IMMM), Joypurhat

Leather Research Institute (LRI), Savar

Estab. of BCSIR Laboratories, Sylhet (proposed)

BCSIR Laboratories Rajshahi

Dhaka Main Campus:

1. BCSIR Laboratories, Dhaka

2. Institute of Food Science and Technology (IFST)

3. Institute of Fuel Research and Development (IFRD)

4. Institute of Glass and Ceramic Research & Testing (IGCRT)

5. Pilot Plant and Process Development Centre (PP & PDC)

6. BCSIR Secretariat

BCSIR Laboratories Chittagong

❶ BCSIR Laboratories Dhaka:

- Largest multi-disciplinary unit
- Major R&D areas:

(i) Analytical chemistry
(ii) Biological sciences
(iii) Chemical technology
(iv) Chemical metrology
(v) Fibre and polymer
(vi) Industrial physics
(vii) Physical Instrumentation
(viii) Pulp and paper
(ix) Soil and environmental science

❷ Institute of Food Science & Technology (IFST):

Emphasizes research interest particularly on different branches of food science and technology

❸ Institute of Fuel Research & Development (IFRD):

Research interest of IFRD includes: renewable energy, biogas, bio-diesel, solar energy, fossil fuel, improved stoves, solar cooker, wind and hydro-energy etc.

❹ Institute of Glass and Ceramic Research & Testing (IGCRT):

R&D projects of IGCRT covers the fields of glass, ceramics, bio-ceramics, building materials, pigments and materials science.

❺ Pilot Plant and Process Development Centre (PP & PDC):

PP & PDC is conducting the techno-economical feasibility study of the processes developed in the different units of BCSIR.

❻ Leather Research Institute (LRI), Savar:

Considering the prospects of leather sector together with the foreign exchange earning potentials, the R&D activities of LRI are particularly confined on leather and leather products, footwear, leather processing chemicals, tannery waste management etc.

❼ BCSIR Laboratories Chittagong:

BCSIR Laboratories Chittagong is also a multi-disciplinary research unit carrying out R&D works on herbs and herbal drugs, traditional & folk medicines and aromatic plants.

❽ BCSIR Laboratories Rajshahi:

Having the view of utilizing the indigenous resources (e.g. lac, wax etc.) of the northern part of the country, BCSIR Laboratories Rajshahi is pursuing R&D activities as another multi-disciplinary laboratory.

❾ Institute of Mining, Mineralogy & Metallurgy (IMMM), Joypurhat :

BCSIR is proud to set up its latest unit IMMM in Joypurhat to conduct research exclusively on mineral resources. This newly established institute is unique of its type in the country.

The Honourable Prime Minister of Bangladesh, **Sheikh Hasina** inaugurated this institute.

The Hon'ble Prime Minister of Bangladesh inaugurated IMMM

The Chairman of BCSIR explaining the development activities of IMMM to the Hon'ble Prime Minister

Institute of Mining, Mineralogy & Metallurgy (IMMM)

IMMM offers:

- Testing facilities of rock, coal mine samples
- Development of gemstones from rock

Rock specimen for gemstones

ADP and other projects

Besides carrying out regular R&D assignments, all the units of BCSIR are executing aided projects, technical assistance projects and various development projects under the annual development program (ADP) of the government.

Project	No.	Focused areas
ADP	7	Chemical metrology, bio-metallic implant, analytical research, food safety, strengthening of IMMM, CTG. Labs
Special allocation of MoST	6	Aquaculture, rubber based products, food science & technology

Manpower of BCSIR

Category	Approved Post
Class I	399
Class II	236
Class III	537
Class IV	223
Total	**1395**

Scientists working	Total	No. of Ph.D
CSO: **9**	**282**	**72**
PSO: **26**		
SSO: **97**		
SO: **150**		

The approved manpower as it appears in the above table is of 1984. Since then, three more institutes have been established and the requirement of manpower has risen accordingly. Moreover, research in the novel field of science and technology is essential. For that reason too, the number of scientists need to be increased. The process of recasting the old organogram is in progress and hopefully this will be materialized in a short time.

Success story of BCSIR

♦The success story of the BCSIR began from the very beginning and since then it keeps adding credits to its account. Development of **partex from jute-stick, jutton, efficient portable biogas plant, energy efficient cook stove, iodine test kit, formalin test kit, fire extinguisher, spirulina as food supplement** etc. are still recognized as noteworthy scientific achievements of BCSIR.

♦ BCSIR has developed brake oil which is of international standard and the transport pool of BCSIR as well as the Government transport pool are using this brake oil.

♦ Wax free "lac" is being supplied to the Bangladesh Ordnance Factory (BOF) which is used in bullet shell.

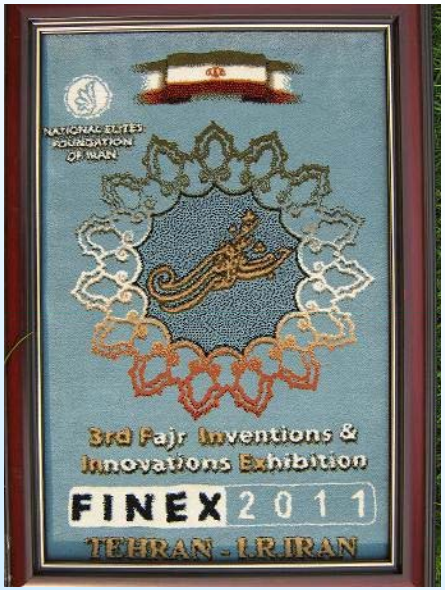
However, during the present Government's regime this leading PRI has made commendable achievements in (i) R&D activities and (ii) capacity building.

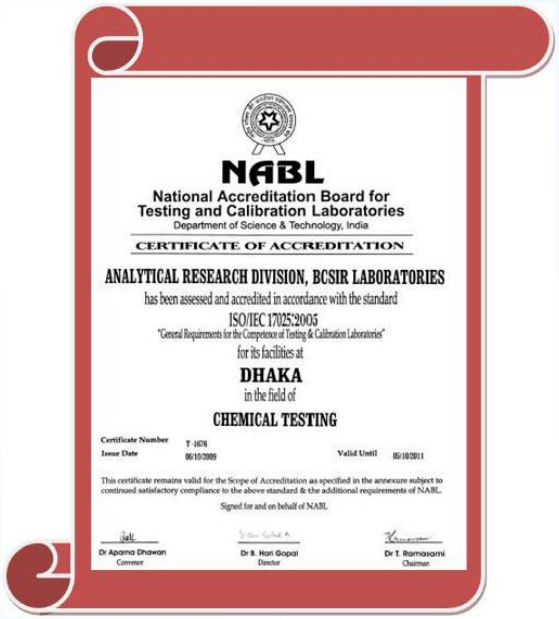
Snapshot of BCSIR activities in the last 3 years

❶ R&D achievements

♦ BCSIR participated in the 3rd FAJR Regional Innovations and Inventions Exhibitions 2011 in Iran and won the 3rd prize in recognition of its innovative R&D activities.

♦ BCSIR has proudly entered into the world market receiving the ISO 17025 accreditation to analyze 26 water quality parameters.




NABL
National Accreditation Board for Testing and Calibration Laboratories
Department of Science & Technology, India
CERTIFICATE OF ACCREDITATION
ANALYTICAL RESEARCH DIVISION, BCSIR LABORATORIES
has been assessed and accredited in accordance with the standard
ISO/IEC 17025:2005
"General Requirements for the Competence of Testing & Calibration Laboratories"
for its facilities at
DHAKA
in the field of
CHEMICAL TESTING
Certificate Number T-1676
Issue Date 06/10/2009
Valid Until 05/10/2011
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.
Signed for and on behalf of NABL
Dr Aparna Dhawan, Convenor
Dr B. Hari Gopal, Director
Dr T. Ramasami, Chairman

♦ Cost-effective and portable fiber-glass biogas digester has been developed to generate electricity using biogas technology.

Hon'ble Prime Minister of Bangladesh inaugurated the biogas plant set up at "Gonobhaban"

♦ Solar grid hybridization technology has been developed to save electricity and to get uninterrupted power supply in the urban area.

♦ Development of dual-fuel (CNG/diesel) engine is a significant step for irrigation purposes which ensures 60% fuel savings.

♦ Electricity saving LED lamp has been developed.

Hybrid solar-grid system

Dual-fuel (CNG/Diesel) engine

LED lamp

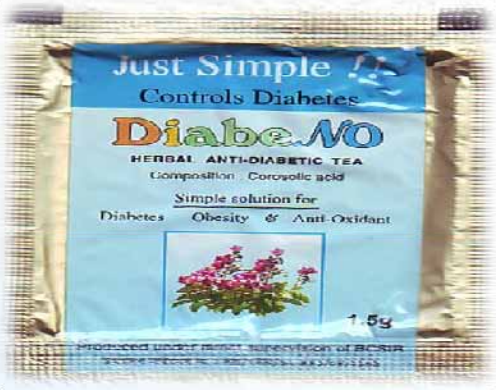
Developed Food Products

Strawberry juice

Mango juice

Vegetable candy

Herbal basak tea



Herbal anti-diabetic tea

Trifala health drink

♦BCSIR is designated as the Bangladesh Government agency responsible for the performance verification of arsenic removal technologies to be marketed in Bangladesh.

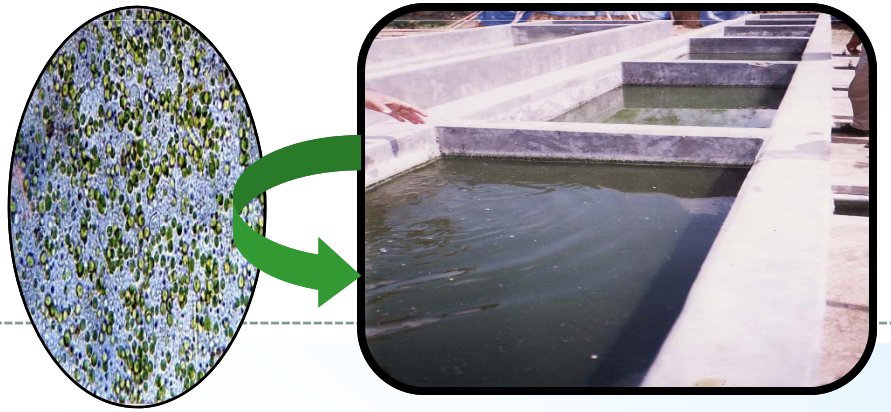
♦ Cost-effective “Arsenic removal filter” and “Arsenic detection kit” have been developed.

Arsenic removal filter

Arsenic detection kit

Developed other products

Poultry feed from waste fish scale



Livestock feed from green algae

Liquid livestock feed pilot plant

Energy saving brick

Energy efficient brick

Bio-ceramic material

Polymer modified bitumen

Developments in leather research include:

- Glutaraldehyde for the chrome free leather tanning process
- Eco-friendly pickling agent for leather processing

Finished leather goods

BCSIR has expanded R&D activities in the area of **Nanotechnology**:

♦ Development of slow release **nano-fertilizers**, (incorporating into porous ceramic materials, *e.g.* zeolite and hydroxyapatite etc.) is going on which would be a significant step in the context of fertilizer consumption efficiency in Bangladesh.

♦ Development of **nano-solar panel** is going on.

♦ Development of photocatalytic reactor using the photocatalytic **nano composite materials** for the treatment of textile effluents is also going on.

Public-private partnership (PPP) and MoU

BCSIR has recently entered into MoUs with 14 public and private universities, research organizations and private entrepreneurs to create a symbiosis of R&D activities.

❷ Capacity building

♦A distinctive reference institute "Designated Reference Institute of Chemical Measurements" has been established recently. Hon'ble Prime Minister of Bangladesh will inaugurate **DRICM** very soon.

View of DRICM

DRICM facilitates:

- Proficiency Testing (PT).
- Inter-Lab Comparison (ILC).
- Design Qualification, Installation Qualification, Operation Qualification, Performance Qualification (DQ/IQ/OQ/PQ) of equipment.
- Characterization / qualification / certification of ‘Active Pharmaceuticals Ingredients (API)’.

Laboratories of DRICM

♦A modern "Food Safety Laboratory for Research to Produce Safe & Quality Food to Support Food Processors" has been established under the ADP of the Government.

View of Food safety laboratory

♦ State of the art "Microbiology Laboratory" has been established under the ADP. Very soon this laboratory will receive ISO 17025 accreditation for selected scopes of microbiological testing of food and water.

♦Bio-metallic Implant Laboratory has been set up under the ADP.

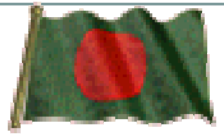
♦ Environmental Quality & Soil Health Lab has been established.

♦ Establishment of the Institute of National Analytical Research and Service is going on under the ADP of the Government.

♦ "One-stop Analytical Service Cell" has been set up to expedite the analytical service and to establish a better coordination spirit with the clients. BCSIR can now provide quality analytical services in different fields *e.g* food technology, ceramic, cement analysis, water analysis, mining and mineralogy, chemical metrology etc.

❸ Paper, process and patents

No. of Papers published		Process	Patents
National	150	♦ Accepted : 63 ♦ Leased out : 57 ♦ No. of Lessee : 107 ♦ Employment : 3500	22
International	80		
Total	230		



Other activities of BCSIR:

- Appropriate technology dissemination:

  BCSIR disseminates the developed appropriate technologies focusing the economic development of the country as a regular joint venture program with the Ministry of Science and Technology.

- Human resource development:

  (i) Provides research supervision to university students for partial fulfillment of academic degrees.

  (ii) Facilitates in-house training programme on sophisticated instruments (in the last 2 yrs 195 scientists availed this training)

  (iii) Grants different fellowships to promote and support young scientists.

- Science fair organization:

  Organizes science fair to encourage and motivate the young scientists as well as entrepreneurs.

Fields for collaborative research

BCSIR is happy to expand research network through joint venture program with COMSATS member states. The prioritized areas for collaborative research are:

- Nanotechnology
- Chemical metrology
- Renewable energy
- Food science and technology
- Materials science

We will highly appreciate if COMSATS member states can facilitate training program for our scientists in the above mentioned fields

National Martyrs Memorial

Thank you

Welcome to visit BCSIR and Bangladesh

Shahid Minar National Monument

World's Largest Mangrove Forest

Hanging Bridge, Rangamati

World's Longest Sea Beach

National Parliament

Tea Garden, Sylhet