



COMSTECH Ten-Year STI Strategic Plan

Building Bridges and Nurturing Scientific Talent:

**2nd Meeting of the
COMSTECH Scientific Advisory Council (COMSTECH-SAC)**

Date: 12-13 June, 2023

Venue: COMSTECH Secretariat, Islamabad, Pakistan

COMSTECH Secretariat, 33-Constitution Avenue, G-5/2, Islamabad
Telephone: 92 51 9220681-3,
Fax: 92 51 9211115 / 9220265 / 9205264
<http://www.comstech.org>

Table of Contents

Sr. Nos.	Titles	Page Nos.
1	COMSTECH: Vision and Mission	1
2	Introduction	2
3	Priority Areas for COMSTECH Intervention	3
4	Operational and Methodological Strategies	3-5
5	<p>Priority Areas: Actions, Initiatives and Cooperation therein</p> <ul style="list-style-type: none"> • Capacity Building Of Member States Through Intra-OIC Cooperation <ul style="list-style-type: none"> - Health and Medicine - Climate Change, Environment, and Water Resources - Technological initiatives for Food Security - Innovation, entrepreneurship, and the commercialization of research - Science Policy Advice to OIC Countries and Institutions - Encouraging Research, Teaching and Innovation <ul style="list-style-type: none"> i. Science: education, research and applications ii. Industrial Biotechnology iii. Artificial Intelligence • Uplifting and Retaining Skilled Manpower 	<p>5-9</p> <p>10</p>
6	OIC-15 for development of Key Initiatives in Emerging Technologies and for confronting major challenges	10-11
7	Resource Generation and Mobilization	11-12

COMSTECH: Vision and Mission

COMSTECH the Ministerial Standing Committee on Scientific and Technological Cooperation of the OIC (Organization of Islamic Cooperation) was established by the Third Islamic Summit of OIC held at Makkah, Saudi Arabia in January 1981. The President of Pakistan is Chairman of COMSTECH. The core mandate of COMSTECH is to strengthen cooperation among OIC Member States in science and technology (S&T), and enhance their capabilities through training in emerging areas, undertake follow-up-actions and implementation of the resolutions of the OIC, and to draw up programs and submit proposals designed to increase the capability of the Muslim countries in science and technology (S&T). The ultimate aim is to build and nourish a scientific culture in addition to using S&T as a major contributor to socio-economic development and rapid industrialization.

The objectives of COMSTECH include:

1. Assessment of human and material resources of Member States and identification of scientific and technological needs and requirements of the Ummah,
2. Building indigenous capabilities of Member States in the fields of science and technology through cooperation and mutual assistance,
3. Enhancement of cooperation and coordination in scientific and technological fields amongst the OIC member states with a view to achieving collective competence in science and technology for solution of the problems of the OIC member states,
4. Creation of an effective institutional structure for planning, research, development and monitoring of scientific and technological activities at national, regional, and international levels.

COMSTECH works in close collaboration with various Standing Committees and other organs of the OIC, Member States and their major Scientific and Technological Institutions, in addition to various international organizations. The latter include; The World Academy of Sciences (**TWAS**), Islamic World Educational, Cultural and Scientific Organization (**ICESCO**), Islamic World Academy of Sciences (**IAS**), Islamic Development Bank (**IsDB**), Global Environment Facility (**GEF**), United Nations Environment Program (**UNEP**), United Nations Development Program (**UNDP**), International Foundation for Science, (**IFS**), World Health Organization – Eastern Mediterranean Regional Office (**WHO–EMRO**), International Centre for Genetic Engineering and Biotechnology (**ICGEB**).

COMSTECH Ten-Year STI Strategic Plan

Building Bridges and Nurturing Scientific Talent:

➤ INTRODUCTION

COMSTECH has a variety of responsibilities assigned to it through its charter and via the periodic resolutions of the CFM, and the STI Summits.

COMSTECH's main responsibilities can be summarized as follows:

- a. Raising the awareness within member states of the vital need to develop their respective STI policies, implementation procedures, timelines, and tangible goals for harnessing the power of STI to address the multifold needs of their societies and the encountered challenges.
- b. Identifying and nurturing the scientific talent and providing it requisite support to enable it to continue to expand the frontiers of knowledge, as well as towards contributing to the social and economic uplift of their respective countries.
- c. Strengthening the existing OIC institutions of scientific research, and tending and fostering linkages and networking between them thereby creating the requisite synergy for mutual benefits and strengthening.
- d. Identifying the contemporary and emerging challenges in science and technology as well as those that may emerge as a consequence of unbridled application of technology with subsequent environmental, social, economic and psychological costs.

The purpose of the present document is to chart the way forward for COMSTECH in terms of the strategies that needs to be adopted for attaining or moving towards the above mentioned goals. We also need to clearly identify those priority areas in which we need to focus our limited resources, as well as identifying broadly the programmes, the initiatives, and the cooperative linkages both within and outside the OIC that may be utilized for converting these goals and targets into realities.

It is important to note, as experience has shown, that financial and human support from member states, which is crucial for successfully implementing these plans and activities is very often contingent and dependent on the visible or tangible ground impact that can accrue from undertaken initiatives. Both the funding institutions and the member states are keen to see immediate or short-term visible benefits that flow from these initiatives and programmes. At the same time COMSTECH is aware, like all international developmental institutions, that many and in fact the more important and far reaching impact flows from initiatives that require a significant time for maturity and for realization of their full potential. As such, COMSTECH strategy should take into consideration both the longer term and shorter term outcomes of its initiatives so as to maintain a healthy balance between immediate positive outcomes and longer term development of capacity and awareness.

➤ Priority areas for COMSTECH intervention

1. Capacity building of member states through intra-OIC cooperation in the following areas:

- a) Health and Medicine
- b) Climate Change, Environment, and Water Resources
- c) Food Security, in particular the aspects related to science and technology applications (Advanced Agricultural techniques, genomic applications)
- d) Innovation, entrepreneurship, commercialization of research, and industry-industry interaction between member states
- e) Science and technology policies: (Devising and implementing appropriate policies)
- f) Encouraging research, teaching and innovation in basic and emerging sciences
 - Industrial biotechnology
 - Artificial Intelligence: Its development as a technology with vast economic, commercial and organizational potential; Social implications of AI.
 - Disease surveillance and pandemic preparedness

2. Uplifting and retaining skilled manpower:

- a) Organization of skill development programmes of existing manpower
- b) Professional rehabilitation of scientists and technologists returning to parent countries
- c) Extending help to industries through linking innovation strengths of academic and research institutions in key areas.

➤ Operational and Methodological Strategies

- A main strategic effort has to be to channelize our efforts in line with the agreed priorities and targets of the OIC, as expressed in the STI Summits, CFM, and the plans, vision documents and with the Action Matrix periodically announced by the OIC. This will also enable greater ease of acquiring financial support from the OIC-GS and its related funding bodies.

Similarly, our strategic directions should be aligned along those of international development organizations and use their accepted terminologies such as the various SDGs, STEM, Women's education in Science etc. to enable greater understanding and coordination and support from bodies such as the UN, FAO, WHO, UNESCO, EU etc.

We need to be acutely aware of the strategic goals of at least the leading OIC countries such that our proposed initiatives find resonance with their policy makers and S&T organizations.

- COMSTECH has a limited scientific manpower base of its own and in general organizes its initiatives utilizing the vast scientific pool of the OIC, in particular that of the host country, Pakistan. Hence, our operational strategy should include the following:
 - a. Events and programmes utilizing COMSTECH's own resources only with participation of various institutions and individuals.
 - b. COMSTECH partnerships with other OIC organizations to organize various initiatives.
 - c. COMSTECH partnerships with local (Pakistani) organizations to organize various programmes.
 - d. COMSTECH partnership with international organizations e.g. UNESCO, WHO, FAO, TWAS, EU etc. to organize various programmes and initiatives or obtaining international sponsorship for thematic areas of acknowledged importance e.g. an OIC Program for STI Policy making.
 - e. COMSTECH partnerships with OIC expatriates to gain from their scientific expertise and their access to prestigious international academic and research institutions.

- COMSTECH contribution to organization of local events may take the following forms:
 - a. Selectively contributing to the travel support of resource persons,
 - b. Providing boarding and lodging facilities (local hospitality) to resource persons and participants,
 - c. Providing its organizational resources (auditorium, lecture rooms, meeting rooms, local transport etc.) to host the events at COMSTECH Secretariat,
 - d. To coordinate the technical and logistic part of the events.

- For events organized outside of COMSTECH our support may include,
 - a. Travel support to some experts,
 - b. Identification and coordination with experts,
 - c. Preparation of scientific and technical programmes,
 - d. Publicizing the events via our social media platforms and through our publications.

- The coordination and cooperation should take into account the various forums established already, such as the Steering Committee for implementation of OIC STI Agenda 2026, and the Expert Groups established therein; the Annual

Coordination Meetings of the OIC; the OIC-15 Dialogue Platform; and the COMSTECH Inter-Islamic Networks. The programmes and initiatives should also be coordinated with the platforms already established by COMSTECH itself, such as the Consortium of Excellence, the OIC Technology Portal, the Africa Health initiative etc. It is important that instead of establishing new platforms, the existing ones should be further activated and strengthened.

➤ **Priority Areas: Actions, Initiatives and Cooperation therein**

● **CAPACITY BUILDING OF MEMBER STATES THROUGH INTRA-OIC COOPERATION:**

A. Health and Medicine

COMSTECH interventions along the following directions are proposed in partnership with the OIC-GS, IsDB, Member States, and WHO, etc.

- a. Virology, Epidemiology and Pandemic Management
- b. Vaccine Development in Member States
- c. Mother and Child care
- d. Africa Health Initiative

a. Virology, Epidemiology and Pandemic Management

COMSTECH efforts will be directed towards provision of trainings, Fellowships and facilitating networking and research collaborations in this field. Already in place COMSTECH Fellowships in Virology to be extended to epidemiology trainings, Fellowships and Workshops. In particular, pandemic management, building on the experience gained from the handling of the COVID-19 pandemic to serve as a basis for establishing a Pandemic Studies and Managing Network of Member States.

b. Vaccine Development:

There is a huge dependence of member states on importing vaccines for all varieties of needs. However of late, efforts have been initiated to increase/initiate indigenous capacity for vaccine development. The Vaccine Manufacturing Group of the OIC, and COMSTECH, with the cooperation of the government of industries has supported trainees at Biopharma, in Indonesia. We have plans to collaborate with GAVI in the provision of vaccines to member countries.

The effort needs to be expanded to include other host countries, and to complemented host workshops and other trainings.

c. Mother and Child care

The level of pre and post-natal mortality rates are very high in many member states. Basic level facilities and expertise are often missing or deficient. There is strong need to work in this domain along with other concerned international organizations.

d. Africa Health Initiative:

In view of the very dire health situation in most Central and West African Member States, COMSTECH already has prepared a Five Year Action Plan on Health for African Countries. This comprehensive plan has been submitted to the OIC-GS (S&T) for support. Currently COMSTECH is organizing medical camps in Ophthalmology with the cooperation of the IsDB, LRBT and the Health Services Academy.

B. Climate Change, Environment, and Water Resources

COMSTECH has launched the Forum on Environment and Ecosystem Restoration (CFEER) in June 2022 in the backdrop of growing importance of promoting environmental sustainability and resilience to face the challenges of climate change, biodiversity loss and ecosystem restoration. The forum is intended to be a platform for knowledge and information sharing among the institutions of OIC member countries and developing countries in the spirit of South-South and Triangular Cooperation on issues relating to climate change, biodiversity loss, nexus of food, water and energy security and ecosystem restoration under the framework of the Paris Climate Agreement, 2030 UN Agenda for Sustainable Development and 2012-2030 UN Decade on Ecosystem Restoration. The forum will collaborate with international organizations and with the UN agencies to achieve the desired goals. COMSTECH will also take initiatives towards developing policy reforms in member states for reducing greenhouse emissions, increase in use of green technologies, promoting use of e-mobility etc. This includes policy reforms towards energy efficiency practices, sustainable urbanization practices, water use efficiency, introducing green building codes and shifting towards renewable energy sources. The initiatives will include training workshops, development of policy papers and guidelines for member states.

C. Technological initiatives for Food Security

Addressing the issues of **food security and nutrition** in member states. In particular utilizing the power of biotechnology and genetic engineering for providing solutions towards agriculture in stressed conditions and towards preservation of existing plant and crop varieties by developing plant gene banks. Cooperation with the IOFS and COMCEC for various food security related trainings and fellowships for scientists and researchers. Cooperation with OIC organs specializing in stressed agriculture. Enhanced trainings and capacity building in gene bank development and management.

D. Innovation, entrepreneurship, and the commercialization of research

The importance of encouraging innovation, developing entrepreneurship and encouraging basic research to connect with the social and economic needs of society is now well appreciated. Towards this end, countries are actively pursuing the support of national incubation centers and the development of science and technology parks. COMSTECH has been actively engaged in the promotion of innovation through series of exhibitions, training workshops and competitions. There remains a strong need to provide trainings to member states for their development of science and technology parks, incubations centers and the requisite facilities and policies to promote these centers. COMSTECH also needs to continue efforts to connect OIC researchers with industry in their related areas e.g. through highlighting commercializeable research in workshops, exhibitions, and through its scheme of awards for outstanding patents.

Industry-Industry Interaction between member states: COMSTECH may use its technology portal to introduce OIC innovators and entrepreneurs with each other. In partnership with OIC organs such as the Islamic Chamber of Commerce, Industry and Agriculture (ICCIA) it can make efforts to bring together industries in member states for cooperative industrial enterprises.

E. Science Policy Advice to OIC Countries and Institutions

Various factors afflict the efficacy of the science, technology and innovation (STI) ecosystems in OIC countries, and indeed their capacity to harness the power of STI for socioeconomic progress and economic well-being. Such obstacles include, inter alia, lack of comprehensive Science, Technology and Innovation (STI) policies, and strategies emanating therefrom, the dearth or inadequacy of resources, infrastructure and institutions, gender imbalance in Science and Technology, shortage of trained personnel, prohibitive costs of acquiring knowledge and technology, and barriers to the transfer of knowledge, personnel and technologies from developed countries.

To address these shortcomings, COMSTECH may with the help of the COMSTECH-SAC:

1. Assist OIC member countries to build up their science advisory capacity and develop appropriate science advisory mechanisms to complement their own national needs.
2. Offer advice and evidence-based counsel to member states of the OIC and OIC organizations on STI policies and activities.
3. Undertake reviews and consultations on national STI policies and strategies in OIC member countries.
4. Organize outreach meetings to share experiences and best practices in the domain of science advice to governments, policy-makers and other stakeholders, in cooperation with similar networks from around the world.

F. Encouraging Research, Teaching and Innovation

i. Science: education, research and applications

There is a strong need for revising both the curricula and the training methodologies of higher education institutions in member states. Most countries are still not emphasizing sufficiently on concept development, applications orientation and skill development in their academic training. Furthermore, innovation is not inculcated in the research training and consequently academic research remains distant from possible applications and problem solving. A second serious shortcoming is the limited size of the scientific manpower, the inadequate resources at its disposal and the consequent qualitative limitations in OIC scientific research and knowledge.

To address these concerns COMSTECH will concentrate on the following strategies:

- a. Organizing of scientific conferences and training workshops in partnership with international scientific organizations.
- b. Awarding of research grants, research fellowships and trainings at the premier institutions in member states.
- c. Training schemes for technicians to enable improved maintenance of high-level scientific equipment.
- d. Travel and hosting grants for exchange visits of scientist between member states to enable sharing of expertise and for overcoming the shortage of scientific experts.
- e. Continuation of scheme of scientific awards in various disciplines and for best patent, outstanding publications and demonstrated scientific promise.
- f. Development of Research Consortia of Universities: Each research consortium, consisting of the required number of universities or research institutions of different member states, may be organized to combine their resources for investigating a particular research problem or towards devising a particular research application.
- g. Utilization of the scientific diaspora of OIC countries. Benefiting from the very large pool of scientists, engineers, innovators and educators who are resident in the developed Western countries, COMSTECH can initiate programmes for improvement of educational curricula, research training and the development of academic linkages between institutions of member states and host countries of expatriate scientists. COMSTECH Consortium of Excellence (CCoE) can play a central role as hosts of expatriate scientists and engineers for short periods and as nucleating centers for contemporary themes of research connected with innovative and applications oriented outcomes.

ii. Industrial Biotechnology

Industrial Biotechnology is one of the most promising new approaches to pollution prevention, resource conservation, and cost reduction. If developed to its full potential, industrial biotechnology may have a larger impact on the world than health care and agricultural biotechnology. It offers businesses a way to reduce costs and create new markets while protecting the environment. COMSTECH will interact with ICGEB and other international organizations to create cooperation between member states in this new technology.

iii. Artificial Intelligence

The so-called Fourth Industrial Revolution powered by Artificial Intelligence has the potential to raise global income levels and improve the quality of life for populations around the world. Technology has made possible new products and services that increase the efficiency and pleasure of our personal lives. OIC countries need to develop their knowledge, skills and adaptation to this new technological environment. The OIC-15 Platform has already adopted AI as the first major theme of collaboration between member states and several activities have been approved in principle¹. The proposed initiatives will be pursued vigorously and may be further improved after discussion and dialogue with AI experts of Member States.

• UPLIFTING AND RETAINING SKILLED MANPOWER

a. Organization of skill development programmes of existing manpower

COMSTECH Skills Development Programme aims to develop the expertise of youth in demand driven and employable skills along with formal education, for a short training duration of 3-6 months. The programme will produce master trainers for OIC Member States to impart trainings in their countries. The programmes will be developed in both formats, physical and online, in partnership with the COMSTECH Inter-Islamic Network on Virtual Universities (CINVU), and OIC institutions such as SESRIC, ICESCO.

b. Professional rehabilitation of scientists and technologists returning to parent countries

A common malaise in member states is the inability to provide suitable working environment, startup funds, and maintenance of scientific contacts of young scientists returning to their homelands after acquiring valuable higher education and trainings. This often results in frustration and in many cases to the inability of scientists to settle in and to contribute to their nations. To address this situation, COMSTECH will initiate a programme of rehabilitation of scientists and

¹ *Almaty Rules and Regulations of the OIC-15 Dialogue Platform, adopted by the First Ministerial Meeting, May 25-26, 2023, Almaty, Republic of Kazakhstan*

technologists returning to their parent countries. The programme will include small research grants to initiate their work, research fellowships at the more advanced OIC research institutions, and support to organize scientific conferences and workshops.

➤ **OIC-15 for Development of Key Initiatives in Emerging Technologies and for Confronting major Challenges**

COMSTECH proposes to use the OIC-15 Dialogue Platform to coordinate the efforts of member states in addressing major urgent and common challenges. An example of this is the COMSTECH Proposal on “*Preparing OIC Countries for the 4th Industrial Revolution and the Harnessing of Artificial Intelligence (AI)*” approved by the member states for implementation along with the series of activities.

COMSTECH plans to focus on such initiatives with tangible outcomes, as e.g. detailed in the AI project, in the next 4 to 5 years.

Similarly, COMSTECH will prepare and submit to the OIC-15, and other supporting institutions multinational initiatives in:

- a. Addressing the **impact of global climate change** on member countries and determining appropriate regional responses and policies to confront these challenges. Coordination with international organizations such as the UN and their regional programmes will be strongly pursued and efforts will be made to connect national bodies dealing with climate change impact to regional centers and initiatives in this domain.
- b. Addressing the issues of **food security and nutrition** in member states. In particular utilizing the power of biotechnology and genetic engineering for providing solutions towards agriculture in stressed conditions and towards preservation of existing plant and crop varieties by developing plant gene banks. This includes submitting a major multinational project for the promotion of plant genetic resources use in varietal development and integration in the seed system.
- c. Addressing the issue of shortage of experts and educational facilities by **expanding the use of online educational and professional resources**. To address the acute shortage of teachers, master trainers, physicians, social workers etc. in member states there is a dire need to expand the Online services availability in these and other domains. COMSTECH will need to interact with various organizations specializing in virtual education and training programmes to provide appropriate guidance to member states in this respect.
- d. **Pandemic preparedness**: The recent experience of dealing with the COVID-19 pandemic has awakened member states of the OIC towards having an active programme of dealing with pandemics. Since outbreaks such as COVID-19 cannot be

ruled out in the future, it is vital to have in place mechanisms, appropriate human and material resources, as well as policies and strategies for dealing with the multifold consequences of such pandemics and other highly contagious afflictions.

COMSTECH can organize through OIC-15:

- a) Conference to deliberate on the lessons learnt from the pandemic
- b) Workshops for developing policy guidelines for dealing with such pandemics
- c) Workshops and trainings on the applications of AI/IT for managing pandemics
- d) Trainings in epidemiology and virology; collection, management and analysis of pandemic related data.

➤ **Resource Generation and Mobilization**

• **Fiscal Background**

- Currently COMSTECH receives operational expenses for its Secretariat from the Government of Pakistan, in Pak Rupees.
- COMSTECH manages its support to external activities, programs, grants and awards that require foreign exchange cover, partly from the accrued interest from its existing endowment funds or by purchasing expensive dollars on the open market.
- Despite manifest increase in operational costs, due to rising inflation as well as expansion of its programs and activities, COMSTECH resources have not increased accordingly. Very few member states are contributing their (voluntary) annual contributions, and the amount received is highly insufficient to meet its needs.
- Support for the COMSTECH Inter-Islamic Networks that was earlier forthcoming from the Islamic Development Bank is no longer available.

The situation outlined above demands serious attention and remedial action if COMSTECH is to continue to play a dynamic and effective role in promoting cooperation and building up member states' capacity in various areas of S&T.

• **Actions Proposed for resource generation and mobilization**

The following steps are proposed in this context:

- a. Submitting a case to the Government of Pakistan, with the support of the Ministry of Foreign Affairs, GoP, for annual increase of at least 30% in the grant to COMSTECH to cover the effects of inflation on the operational costs of the Secretariat (salaries, energy costs, transport, guesthouse expenses etc.).
- b. Appealing to all member states via President of Pakistan (Chairman COMSTECH), the Council of Foreign Ministers (CFM) and the OIC GS for paying their annual contributions on a regular and enhanced basis. Sharing with the OIC-GS and the

CFM the extent of benefits received by different member states in the form of research grants, travel support, support to activities, and through awards received by their scientists, as well as summary of participation of their scientists and students in COMSTECH activities.

- c. Reaching out to the Zakat Funds of the OIC and the OIC Solidarity Fund for supporting students/researchers from LDC-OIC
- d. Reaching out to the Technology Bank for least developed countries which has a special fund to support such activities in the LDCs.
- e. Working in partnership with OIC organizations such as COMCEC that provide funding for projects in specific areas. Sharing of event costs with partner organizations such as SESRIC, ICESCO, IOFS etc.
- f. Using the OIC-15 Dialog Platform to generate funding and support for major initiatives. As discussed in the Ministerial Meeting, while it is premature to fix an annual OIC-15 contribution to COMSTECH at this initial stage, it was agreed that this matter would be reconsidered once the effectiveness and contributions of OIC-15 become more apparent.
- g. Finding sponsors for COMSTECH Programs. Organization of major events in partnership with member countries, private organizations and international organizations. An example of the former is the Robotics Competition organized in partnership with the Government of Uzbekistan in 2019. Presently we are planning on organizing the 1st OIC Conference of Stakeholders in Artificial Intelligence in partnership with the Government of Qatar alongside their WISE Initiative (World Innovation Summit for Education).

As examples of support from private organizations, we are undertaking a large number of health related activities (medical camps, surgeries and trainings) in Africa with the active support and participation of private benevolent organizations, the Layton Rahmatulla Benevolent Trust (LRBT).

Current examples of support from various international organizations include support from WHO, FAO, IFS, ICGEB, TWAS and the GCISC in different areas such as health, food security, genetic engineering and biotechnology, and global climate change. Some of these sponsorships are extensive while some others have been quite limited and there is a great scope for enhancing them to mutual benefit.

