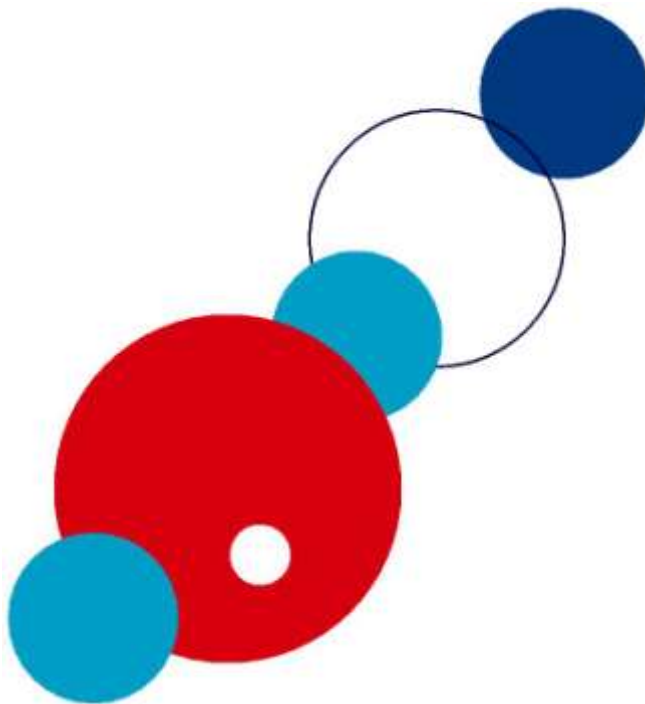


Inter Islamic Network on Nanotechnology (INN)

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1. Executive summary

With the aim of promoting cooperation and advancement in the field of science and technology between member states of Organization of Islamic Cooperation (OIC), the Government of Islamic Republic of Iran as host member states of the Inter Islamic Network on Nanotechnology (INN) has been selected to provide the required administrative, financial, and moral support to making INN a viable and successful institution of the Standing Committee for Scientific and Technological Cooperation (COMSTECH). Following this proposal at the 13th General Assembly Meeting of Committee for Scientific and Technological Cooperation (COMSTECH) held on 2nd-3rd April 2008 in Islamabad, Pakistan, the Inter Islamic Network of Nanotechnology (INN) was formally inaugurated on 8th January 2012 by H.E. Professor Atta-ur-Rahman, COMSTECH coordinator general, in Materials and Energy Research Center (MERC), Karaj, IRAN. The overall goal of the INN is strengthening the relations and technological collaborations improving transfer of knowledge and experience among the academic researchers within Islamic countries.

The first General assembly of The inter-Islamic Network of Nano-Technology and The Conference of “Nanotechnology in Medicine, Industry and Agriculture were held in Material and Energy Research Center in 13-15 of May 2013. Turkey, Afghanistan, Palestine, Komor, Tounisia, Malaysia, Somalia, Pakistan were present at this conference. “The Executive Committee” (Iran, Turkey, Palestine, Malaysia, Somalia) was elected by the majority of the participants and Iran was chosen to be the head of this committee.

2. Background

Nanotechnology is an interdisciplinary field with cross sectoral applications. The potential applications of this technology in the fields as diverse as medicine, agriculture, information, communication, defense, energy, consumer goods, etc. has prompted both the developed and developing countries to initiate programs in nanotechnology geared towards their national needs. INN already boasts as one of the special nanotechnology clusters. Many of INN's nanotechnology Laboratories for a variety of industrial, electronic, and environmental applications are active. Many of these studies are based on discoveries made by researchers at the Universities. Despite these positive developments, INN nanotechnology cluster is struggling to achieve scale and sustainability.

However economic and social benefits from these large investments in research are nevertheless not appearing, as it would be expected, probably due to:

- Gap between research efforts and industrials and user needs.
- Dispersion and fragmentation of efforts
- Broader challenges going beyond sectorial technological gaps which hinder the nanotechnology development and commercialization.
- Poor focus of nano research and innovation to develop products and services able to address the social and economic Grand challenges of our time.

3. Nanotechnology:

Poised for significant growth

Nanotechnology has experienced rapid growth over the past 30 years. Since the invention of the Scanning Tunneling Microscope and the Atomic Force Microscope in the 1980s, researchers have made exciting discoveries, and entrepreneurs and established companies have identified the commercial possibilities of nanotechnology. The forecast growth of nanotechnology applications demonstrates the transformational impact these technologies are poised to make. According to BCC Research, the global market for

nanotechnology products will grow from an estimated \$11.7 billion in 2009 to nearly \$26.7 billion in 2015—a compound annual growth rate (CAGR) of 11.1 percent. Certain segments are forecast to grow at an even faster clip. Global Industry Analysts reports that the worldwide market for nanotechnology-enabled products in such sectors as automotive, chemicals, electronics, and healthcare will reach \$2.41 trillion by 2015.¹

Growth of market for nanotechnology applications, 2009–2015

2009			
2015			
			CAGR, 2015
Nanomaterials	2009	2015	
	\$9.0 billion	\$19.6 billion	14.7%
Nanotools	2009	2015	
	\$2.6 billion	\$6.8 billion	3.3%
Nanodevices	2009	2015	
	\$31.0 million	\$233.7 million	45.9%
All nanotechnology products	2009	2015	
	\$11.7 billion	\$26.7 billion	11.1%

3.1 INN at glance

The establishment of the Inter-Islamic Network of Nanotechnology (INN) has been an initiative of the Standing Committee for Scientific and Technological Cooperation (COMSTECH) to supply Islamic World with new knowledge by connecting the scientists of Islamic Countries and facilitate their access to the resources and promote the required interaction between scientists in the Organization of Islamic Cooperation (OIC) member states. With the aim of promoting cooperation and advancement in the fields of science and technology between member states of OIC. The Government of Islamic Republic of Iran as host member states of the Inter Islamic Network on Nanotechnology (INN) has accepted to provide the required administrative, financial, and moral support to making INN a viable and successful institution of the COMSTECH. In the line with development of INN activities and promoting regional cooperation following initiatives have been done:

- Preparation of the draft of the Statute of INN
- Holding the 1th National Cooperation Conference on INN On 25th October 2011
- Participation in International Seminar on “Nanotechnology & Stakeholders in Pakistan” on 28 Jan2013
- Preparation of INN booklet.
- Participation in 5th international nanotechnology festival (Iran Nano 2012)
- Arranging the General Assembly of INN and Nanotechnology Workshop
- Launching website and Email of INN

¹ *Nanotechnology—A global strategic business report*, Global Industry Analysts, October 2010. (www.strategyr.com/Nanotechnology_Market_Report.asp)

- Receiving more than 35 completed membership forms from OIC countries' scientists
- Devising the Action Plan 2012-2013
- Meeting with officials of regional organizations such as ECO, ISESCO, INSTP and CINVU in order to introducing INN.
- Meeting with the officials of other COMSTECH Networks located in I. R. of Iran for establishing multilateral cooperation.
- Participation in the Islamic events such as Islamic Awakening, Network of Women Scientists of the Islamic World, COMSTECH Inter-Islamic Network on Science and Technology Parks, etc. in order to introducing INN.
- Correspondence with OIC Ministers of Science and Technology by Iranian Minister of Science,
- Research and Technology for introducing the Network and inviting them to applying as member Attending the Parliamentary Friendship Session of Indonesia and inviting Indonesian nanotechnology centers to cooperation with INN
- Holding sessions on application of nanotechnology in medicine, industry and agriculture with attendance of related scientists
- Correspondence with ambassadors in Islamic Countries for introducing INN
- Interaction with COMSTECH

Devising the Action Plan 2012-2013

- Holding First General Assembly, Nanotechnology Workshop and Seminar
- Establishment of Executive Committee
- Establishment of Policy, Financial and Technical committees
- Study on nano needs of INN Networked Member States
- Planning workshops, training courses, consultative services
- According to evaluated needs of member states
- Close cooperation with member states in technical fields

3.2 Link between INN and nanotechnology

Research activities in nanotechnology for the period 2001–2011 for five selected countries belonging to the Organization of Islamic cooperation (OIC) implies on active role of these five member of INN . The selection has been made based on the research output of these countries. The countries are Iran, Turkey, Egypt, Malaysia, and Pakistan. The factors considered are the number of publications, citations per paper, p-index, and collaborative research output. Iran with 7,795 publications and an annual growth rate of 41 % leads the group, followed by Turkey with 3,169 publications and an annual growth rate of 29 %. Turkey however, has a much better citation per paper (8.96), and p-index (63.34) as compared to Iran (4.59 and 54.36, respectively). The most rapid rising member country which has the most comprehensive national nanotechnology program is Iran. Iran set up its National Nanotechnology Initiative in 2005 and has spent USD135M during 2004-2008, half of

which is funded by the private sector. Iranian scientists and industries are active engaging international cooperation activities. It has an established education program to train MSc and PhD students, educating the public and policy makers as well as industry and business community. Iran has been actively engaging ISO nanotech standardization activities and was elected as a member of ISO/TC229 to become a representative of the Middle East and North Africa. Its R&D priorities are Energy, Health, Water & Environment, Nanomaterials and Construction. Iran is heading the ANF Energy and Water Working Group. Details about Iran nanotechnology can be found at its [portal site](#). Iran Nano Business Network (INBN) was set up in 2007 connecting 110 nanotech companies. Infrastructure network was set up in 2004 covering 42 advanced laboratories national wide. In terms of number of ISI publication, Iran has jumped from rank 42 in 2004 to rank 19 in 2008. The embargo on Iran has motivated Iran industry to develop its own technology and products including STM, Water Purification System, Air Filters, Industry Scale Quantity CNT and others.

4. Vision and Objectives

The main objectives of INN network in the field of nanotechnology between member states are as follows:

- To promote cooperation and encourage activities in the fields of education, research, and any other areas relevant to nanotechnology between member states
- To lay the grounds for joint cooperation of scientific, industrial and research centers as well as the researchers of member states in the field of nanotechnology
- To provide easy access to the new markets of nanotechnology products
- To technically support the specialized workshops and the training of qualified human resources in the field of nanotechnology.
- To provide consultative services for establishment of infrastructures needed for nanotechnology in member states
- To observe findings and developments of the advanced countries and to customize them for member states

5. Budget considerations & Implementation plan

The Government of Islamic Republic of Iran as host member state of INN is responsible for finances of INN network. The Executive Committee prepares the annual budget of INN after approval by the General Assembly. With the sanctions and embargoes making it difficult for the Iranian scientists to collaborate internationally, nanotechnology is largely seen as a means to achieve prestige and recognition in the scientific community. In 2003 Iran Nanotechnology Initiative Council was established to determine the general policies for the development of nanotechnology. The Council launched the Nanotechnology Development Plan referred to as “Future Strategy” that covers the period 2005–2015 with the target to be among the top 15 countries in this field. While specific funding levels are difficult to assess, Iran has a nanotechnology strategy that has many similarities to the US National Nano-technology Initiative including a nanotechnology coordinating office. Nanotechnology development in Iran has full political support. The President of Iran has decreed that all government organizations should spend a certain amount of money in their annual budgets on progress of nanotechnology, as well as having national headquarters give reports every six months on the status of nanotechnology.