



Ministry of Science, Research and Technology

**Iranian Research Organization for Science and Technology
(IROST)**

A Review of Activities

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Iranian Research Organization
for Science and Technology

IROST – An Overview

Iranian Research Organization for Science and Technology (IROST), affiliated to Iran Ministry of Science, Research and Technology (MSRT), is one of the leading organizations for development of science, technology and Innovation (STI) in the country. IROST implements major applied projects of national importance and plays a leading role in implementing the strategic S&T policies put forward by MSRT.



IROST President: **Prof. Alireza Ashori**

Number of Faculty: **109**

Number of Technical Staff: **87**



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IROST – An Overview

IROST's International Collaboration

IROST has taken major steps towards developing and enhancing scientific co-operation at international and regional level including:

- Organization of annual Khwarizmi International Awards since 1987,
- Organization of international & regional expert conferences and workshops,
- Establishment of Regional Desalination and Environmental Center,
- Establishment of the UNESCO Chair for the promotion of university-industry co-operation in the process of sustainable development since 2012,
- Active membership, as National Focal Point, in leading international institutions, namely, **APCTT**, **COMSATS**, **COMSTECH**, **NAM S&T** and **WAITRO**.
- Close scientific collaboration with international organizations such as UNIDO, UNDP, FAO, D8, ISESCO, UNESCO, WIPO, TWAS, JICA, KOICA, ECO Cultural Institute, UNCTUD, WBI, IDB, World Bank, AIT, Colombo Plan, ICARDA



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IROST – An Overview

Research Departments at IROST:

- ❑ Department of Agriculture
- ❑ Department of Advanced Materials and Renewable Energy
- ❑ Department of Biotechnology
- ❑ Department of Chemical Industries
- ❑ Department of Electrical and Information Technology
- ❑ Department of Mechanical Engineering
- ❑ Department of New Technology Development Studies



Research Facilities IROST

IROST supports STI activities in the country through the provision of logistic support and advanced research facilities such as:

- ✓ Bio-System Laboratory
- ✓ Chemistry Laboratory
- ✓ Environmental Laboratory
- ✓ Medical Instruments Test Laboratory
- ✓ Materials and Metallurgy Laboratory
- ✓ Electrical, Electronics and Telecommunication Laboratory
- ✓ Heating and HVAC Systems Test Laboratories
- ✓ Pumps Test Laboratory
- ✓ Two Wind Tunnel Facilities
- ✓ Fuel Cell Test Laboratory
- ✓ House Appliance Test Laboratory



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IROST – An Overview

National Scientific Network

- ❖ IROST hosts the National Scientific Network in Iran, which besides IROST, caters to the needs of other Universities and Research and Technology Organizations in the country.



IROST Technology Incubation Center:

The Technology Incubator Center at IROST, which was officially established in 2004, has 111 knowledge based technological companies and aims at providing the required enabling environment for progress of Technology Startups. It plays an important and effective role in the successful functioning of these Startups by providing the necessary support and services including:

- ❑ A nurturing environment to promote the organization of the knowledge based companies
- ❑ Scientific, technical and financial support and consultancy in addition to the general services
- ❑ Strengthening and encouraging technology development activities carried out by the private sector
- ❑ Assistance regarding the completion of research to production cycle for effective application of new technological findings

Available Facilities at IROST Technology Incubation Center:

- ✓ Financial and credit support
- ✓ Suitable office and workshop areas
- ✓ Laboratories located at IROST's various research departments
- ✓ Scientific consultancy and supervision by experienced scientific staff and experts
- ✓ IT services



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Highlights of the Activities during the Last Year

Close Cooperation with COMSATS for establishment of Center for Climate and Sustainability.

- ✓ As the National Focal Point in Iran, IROST has had a close cooperation with COMSATS Secretariat for establishment of COMSATS Center for Climate and Sustainability. Initially, the announcement regarding the proposed Center was circulated among the Iranian Universities and Research Centers through the Iranian Ministry of Science, Research and Technology (MSRT). Subsequently, suitable and competent candidates, namely, University of Zanjan, University of Tabriz, and Faculty of Geography of University of Tehran were invited to separate meetings at IROST to present their case. Finally, credentials of each prospective candidate were sent to COMSATS Secretariat for further consideration.



Meeting with Zanjan University representative.

From left: Zanjan Univ.: Dr. Rostamzad, IROST: Dr. Rostami, Dr. Farhani, and Ms. Jask



Meeting with a delegate from Faculty of Geography of University of Tehran



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Highlights of the Activities during the Last Year

Other Activities

- ✓ Institute of Renewable Energy has been established at University of Sistan and Baluchistan, one of the parties in the trilateral agreement regarding the support of activities for development of renewable energies in ITRG on “renewable Energy”, which was signed during the “Regional Expert Meeting on renewable related energies...”, and the foundation Meeting of ITRG on Renewable Energy”, 31 Oct. – 2 Nov. 2016, in the city of Zahedan, Iran.
- ✓ A meeting was held at the Iran National Science Foundation (INSF) office to discuss the trilateral agreement (MOU) between INSF, University of Sistan and Baluchistan, and IROST to discuss the implementation of the agreement. In this meeting, Dr. Samimi, the Acting President for Research represented Sistan and Baluchistan University. Director of INSF, Dr. Zargham, declared the readiness of his foundation to consider financing of some projects, based on the submitted proposals, and after formal approval by COMSATS.



Meeting at INSF office: from right: Dr. Farhani, IROST Acting President for International Cooperation, Dr. Samimi, Sistan and Baluchistan University Acting President for Research, Dr. Zargham, Director of INSF, Dr. Rostami, IROST International Cooperation Office, Dr. Parsa, INSF International Cooperation Office



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Highlights of the Activities during the Last Year

Holding of 32nd Khwarizmi International Award (KIA)

- ✓ COMSATS provided prizes to two laureates of Khwarizmi International Award (KIA), which were presented at a grand closing ceremony, attended by H.E. Iranian President and other high ranking officials. Especial thanks goes to Dr. Junaid Zaidi, the honorable Executive Director of COMSATS, for his strong and constant support to KIA and for sending an inspiring message to KIA on the occasion.



The KIA laureates



The KIA closing ceremony



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Highlights of the Activities during the Last Year

Participation of a nominated candidate from IROST in a capacity building program by COMSATS

- ✓ In 2018, a nominated candidate from IROST participated, as a resource person, in workshop on “Metrology for Least Developed Countries”, in Gebze Kocaeli, Turkey.



Participants in workshop on “Metrology for Least Developed Countries



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Collaborations with other Centres of Excellence

Although, IROST carried out the following activities to enhance its collaboration with other centers of excellence from COMSATS, it plans to pursue a more effective program in future through organizing joint workshops and executing collaborative research projects in the areas of mutual interest.

✓ **Collaboration with COMSATS University Islamabad**

We have announced our willingness to start collaboration with COMSATS University Islamabad, Pakistan in the field of Cyber Security.

✓ **ECO Science Foundation (ECOSF)**

We have established a dialogue with ECO Science Foundation (ECOSF) to start a collaborating partnership in Science, Technology and Innovation (STI) by signing an MOU. The draft of the said MOU has been agreed upon by both the parties. The MOU considers a broad range of areas of collaboration for the benefit of the people of the region.



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Collaborations with other Centres of Excellence

Communication with some members of the ITRG on “Renewable Energy” and Heads of Centers of Excellence asking for:

- ❖ Information on their past and current research activities and future programs and goals related to ‘Renewable Energy’, so that we could include the same in our updated version of strategy plan to be shared with COMSATS,
- ❖ Plans, if any, for collaborative research work and holding of expert meetings and workshops on topics of interest to the member countries of the ITRG on ‘Renewable Energy’,
- ❖ Possibility of Publishing joint research papers based on collaborative research findings

The ITRG members were also informed about a technology transfer project entitled “Biofuel Production from Microalgae in Saline Water”, which IROST is currently working on and which could involve other members of the ITRG, too.



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Activities related to South – South

As far as South-South cooperation is concerned, there have been few opportunities for such cooperation. However, IROST carried out the following activities to strengthen South-South cooperation.

✓ **The Khwarizmi International Award (KIA)**

Every year, the KIA secretariat invites eminent researchers, innovators and inventors from all over the world (South and North) to present their invaluable achievements in various fields of science and technology. In 2018, the 32nd KIA was organized with participation from various countries including COMSATS member countries (Bangladesh, China, Kazakhstan, Pakistan, Philippine, Syria).

The KIA provides the participants with the opportunity to interact and share experience and find common grounds for cooperation (South-South and South-North) in scientific and technological areas.

✓ **Drafting of an MOU between IROST and Fudan University of Shanghai**

Prof. Dongyuan Zhao from Fudan University of Shanghai, China, one of the Laureates of the 32nd KIA, delivered three lectures at universities in Tehran and was very active and enthusiastic about starting joint collaborative projects related to his specialized area of research. Consequently, an MOU between IROST and Fudan University of Shanghai was drafted as a framework for future collaborations.



Prof. Dongyuan Zhao from Fudan University of Shanghai, China. From left: Prof. Gholami, Iran's honorable Minister of Science, Research and Technology, Dr. Satri, Iran's Vice President of Science and Technology, Prof. Ashori, IROST President



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Science and Technology for achieving SDGs

(1) **Execution of projects** on water desalination (RO, FO), Biogas, Biofuels, solar heating, dust storm control, solar energy, wind energy, etc., using financial support provided by IROST and other private and government sectors. Some examples are given in the following sections:

- Techno-Economic Feasibility Study of Using Solar Energy for Power Generation at Khor & Biabanak Potash Complex, Iranian Mines & Mining Industries Development & Renovation (IMIDRO), Tehran, Iran (SDG7)
- Technical and Economic Feasibility Study of an off-grid Solar-Pumping System for Three Different Capacities at Khor & Biabanak Potash Complex, Iranian Mines & Mining Industries Development & Renovation (IMIDRO), Tehran, IRAN (SDG7)
- Design and Construction of a Downdraft Biomass Gasifier in Accordance with the terms of Biomass Resources in Iran, Iranian Research Organization for Science and Technology (IROST), Tehran, Iran, Ongoing (SDG7)
- Modeling and Conceptual Designing of a Small Scale Fluidized Bed Gasifier to Manage and Generate Energy from Wastes in Iran, Noandish Energy Engineering Company (NEECO), Tehran, Iran (SDG7)
- Feasibility Study and Techno-Economic Analysis of Designing Solid Polymer Fuel Cell and Auto Thermal Reforming of Natural Gas Combined Heat and Power System (CHP), Tadbir Behsazi Tateis, Tehran, Iran (SDG7)



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Science and Technology for achieving SDGs

- Water Desalination by Forward Osmosis (SDG6)
- Study the Use of the Power Plant Cooling Water as the feed Water for Reverse Osmosis System (SDG6)
- The Design and construction of Parabolic Hybrid Thermo-solar Chemical reactors for Hydrogen Production (SDG7)
- The study of the effect of biopolymers and cellulosic fibers on the stabilization of sand dunes on a twelve-hectare scale (SDG13)
- The Study of dust storms and their side effects (SDG13)
- Development of a 2-kW floating air turbine (SDG7)
- Construction of protecting belt for Tele Hamid Station against sand dunes (SDG13)
- Organic Mulch spraying Operation in the area of National Park of Urmia at 9 hectares (SDG13)
- Investigating the production of renewable bio-Hydrogen with manipulated native strains to curtail air pollution and earth warming (SDG7, SDG13)



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Science and Technology for achieving SDGs

- Use of mobile biofilm reactor technology to remove nitrate from unpurified water (SDG6, SDG13)
- Production of polypyrrole and polyphenol copper complexes for solar cell application (SDG7)
- Investigating the Factors Affecting Chlorophyll Crystallization in Storage Tanks in Water Treatment Plants (SDG6, SDG13)
- Extraction of scandium oxide from the Alumina Company's waste products (SDG13)
- The use of modern membrane technologies to reduce water consumption in the power plants (SDG6)
- Design and construction of a small model of waterwheel generating electricity from the river stream (SDG7)



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Science and Technology for achieving SDGs

(2) **Commissioning of three research laboratories** working on energy efficiency (EE) issues related to energy intensive sectors such as Industrial burners and heating systems, HVAC systems, and pumps. The laboratories have been established at IROST using the financial support provided by IROST and other relevant government organizations. In addition to Iran, these research laboratories could be beneficial for socio-economic development of the member countries and the region.



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Science and Technology for achieving SDGs

(3) **Publication of 208 research papers** in national and international journals in the fields of energy (SDG7), water (SDG6), and environment (SDG13).

(4) **Proposed formation of a working group** on Renewable Energy, with members from prominent researchers from Universities and Research Centers and Industry. The working group shall accelerate the activities of the ITRG on “Renewable Energy” in Iran.

(5) **Currently, IROST publishes the** “Journal of Advances in Environmental Technology (AET) (SDG13)” and the “Iranian Journal of Hydrogen and Fuel Cell (IJHFC) (SDG7)”, which present the latest trends in technology development, technology policies, and new products and processes in the related research fields.

<http://aet.irost.ir>; <http://ijhfc.irost.ir>



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Future Programs

- ✓ **Establishment of research and technological cooperation with partners from other COMSATS member countries in the following focus areas :**
 - ❑ Sustainable development of water technologies such as desalination and waste water treatment and improved water utilization in various sectors (SDG6)
 - ❑ Innovative technologies for sustainable development and utilization of clean/renewable energy resources (SDG7).
 - ❑ Sustainable environment such as controlling dust storms and reduction of greenhouse gases
 - ❑ Issues related to food security & health improvement in the member countries.
 - ❑ Development of Biotechnology for application in various sectors in the member countries
- ✓ **Capacity Building Activities**

We intend to collaborate with other member countries to enhance capacity building activities through the provision of advanced technological and vocational training of researchers, university staff and technical manpower in related areas of interest and technological importance to the members.



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Future Programs

- ✓ **Proposed Expert Meetings, Training Workshops, etc.**
 - ❑ Expert Meeting on “Climate Change, Water Treatment, Reuse and Desalination (SDG6, SDG13)
 - ❑ Expert Meeting on “Innovative Technologies for Sustainable Development and Utilization of Clean/Renewable Energy Resources” (SDG7)
 - ❑ Training Workshop on “Improving Efficiency of Energy Intensive Industrial/Domestic HVAC Systems” (SDG7)
 - ❑ Training Workshop on “Standard Testing Methods for Evaluation of Safety of Genetically Modified Agriculture Produce in COMSATS Member Countries” (SDG3)
 - ❑ Expert Meeting on “Management and Use of Genetically Modified Agriculture Produce and Evaluation of Threats to Human Health” (SDG3)
 - ❑ Establishment of COMSATS’ Regional Laboratories for Risk Assessment and Detection of Living Modified Organisms (LMOs)” (SDG3)
 - ❑ Training Workshop on “Fermentation Processes for Application in Food Industry” (SDG2)



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**Thank you
for your attention**



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