annual report
2016
His Majesty Sultan Qaboos bin Said
May Almighty Allah bless His Majesty with sound health, peace and long life
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National Innovation Strategy
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As we enter the second decade of The Research Council, our determination to move forward with confidence, towards continued achievements in scientific research, sustainable development, and innovation, remains undiminished.

During this year, TRC continued as per its strategic plans, to meet the aspirations of the Omani society, while adapting to the regional and international trends.

In 2016, the many challenges that TRC’s programs faced were used as motivation to search for innovative solutions that adhere to the current financial situation of the Council and to ensure the continuity of its various programs.

I am pleased to acknowledge the completion of the draft of the National Innovation Strategy, which has been submitted to the concerned authorities in the Sultanate.

The draft has been culminated through the tireless efforts of the participant committees and concerned work teams, compiled of members from inside and outside of TRC.

Finally, I express my appreciation to the esteemed members of TRC Board, and to all TRC employees for their dedication and efforts. Through hard work and the pursuit of knowledge, we look forward to 2017 being a year full of new scientific research, that further adds to the achievements and progress of the Sultanate.

Shihab bin Tariq Al Said
Advisor to His Majesty the Sultan
Chairman of
The Research Council
HE Sultan bin Salim Al Habsi
Secretary General of the Supreme Council for Planning

HE Sheikh Mohammed bin Said Al Khalbani
Minister of Social Development

HE Dr. Madeeha bint Ahmed Al Shaibaniyah
Minister of Education

HE Dr. Ahmed bin Mohammed Al Saidi
Minister of Health

HE Dr. Mohammed bin Hamad Al Rumhi
Minister of Oil and Gas

HE Dr. Rawya bint Saud Al Busaidiya
Minister of Higher Education
Deputy TRC Chairman

HH Sayyid Shihab bin Tariq Al Said
Advisor to His Majesty the Sultan
Chairman of The Research Council

HE Sheikh Mohammed bin Said Al Khalbani
Minister of Social Development

HE Sultan bin Salim Al Habsi
Secretary General of the Supreme Council for Planning
Despite the financial challenges to the various projects, programs and initiatives of TRC in 2016, the Council has strived to find new alternatives of funding. TRC has worked on strengthening collaboration with its partners from the private sector to continue the gains made by the Council’s efforts in supporting the research and innovation activities.
The ‘Upgrade’ initiative of the Council, represented in the Information and Communication Technology Sector (ICT), was established with the aim to help graduating students transform their final year projects into start-ups. ‘Upgrade’ provides business consultation, networking and mentoring opportunities from the various partners of the program, made up of The Research Council (TRC), Oman Telecommunications Company (Omantel), SAS for Entrepreneurship from the Information Technology Authority, The Public Authority for Small and Medium Enterprises (SMEs) Development Riyadah, and Ibtikar Development Oman (IDO).

The program aims to support entrepreneurship and innovation, in line with the government plan for economic diversification, and to provide more self-employment and new job opportunities for Omani youth.

The best projects will be offered fast tracked incubation and business consultations, in addition to a seed fund to help them upgrade into startups.

TRC’s Excellent Partners:
Falling Walls Lab Competition

In October 2016, TRC hosted for the first time in the Sultanate and the GCC countries, the Falling Walls Lab Competition, in collaboration with the Falling Walls Lab Association in Germany, with the aim to build and strengthen connections between distinguished academicians, innovators and entrepreneurs from all areas.

128 projects participated in the competition
18 projects competed in the finals
3 participants awarded

Idea of the Competition:
- Discover talented people and innovators from all areas.
- Exchange ideas with fellow researchers and experts.
- Participate in discussions with high-level scholars and experts.
- Present a research idea, project, business plan or a social initiative that addresses one of the contemporary issues in 3 minutes.

Competition Stages:
- Announcement of opening the applications
- Sorting of applications
- Evaluation of applications
- Presentation of proposals and research projects
- Announcement of the winner

Sponsored by:

Out of 128 entries, one represented the Sultanate at the Falling Walls Lab International Conference in Berlin.
Ibtikar Development Oman SAOC (IDO)

TRC helped to establish Ibtikar Development Oman in cooperation with a number of partners. The company aims to invest the equity interest of OMR 50 million in emerging projects related to international technological fields. This investment also aims to attract global companies to invest in local human and natural resources, benefiting the Sultanate directly by knowledge transformation and development. In addition, the company will work on investing and funding its administration and employees, whom have national experiences, to give their instructions, knowledge of market, work development and funding systems through the progression of the emerging projects.

TRC’s Partners in IDO:
Omani Youth at the 58th London International Youth Science Forum

As part of the Council’s plan to raise awareness among young researchers, The British Council, Zubair Corporation and Al Habib & Company LLC, funded an Omani student delegation’s participation at the 58th London International Youth Science Forum (LIYSF) giving them the opportunity to interact with their peers from around the world and to be informed on the latest developments from the different research and knowledge fields. This participation provides young Omani researchers with an opportunity to benefit from the same successful experiences and distinctive programs offered to the world’s youth.

Participation in The 66th Lindau Nobel Laureate Meeting in Germany

Rahma Khalfan Saif Al Busaidiya, Demonstrator at the Department of Physics at Sultan Qaboos University, have become the first Omani to represent young Omani researchers at the 66th Lindau Nobel Laureate Meeting in Germany. Her participation, which is the first of its kind, is one of the benefits obtained by The Research Council (TRC) after becoming an academic partner in Lindau organization in 2015. TRC can now nominate young Omani researchers to attend the annual Lindau Nobel Laureate Meetings.

WIPO National Workshop on the Patent Cooperation Treaty


TRC’s Partners that funded LIYSF:
Major Activities and Events

1. The Third Annual Research Forum
2. The National Research Award
3. TRC Board Meetings
4. Meetings of the International Advisory Board
5. The Regional Meeting of the Global Research Council
6. International Collaboration
7. Awareness and Publications
8. Human Resources
The 3rd Annual Research Forum

The 3rd Annual Research Forum plays a significant role in achieving the objectives of the National Research Strategy and supporting the research culture in the Sultanate of Oman, in addition to transferring knowledge and exchanging experiences between researchers. The forum was also an opportunity to present the latest research updates by encouraging researchers from the different scientific fields to present their work, and to acknowledge the achievements of the research programs that were funded by TRC.

A total of 60 research projects funded by TRC participated in the forum from various universities and colleges in the Sultanate. The forum included delivering 21 presentations of the completed research projects, presentation of 30 posters of the completed research projects within the Open Research Grants program, 6 posters of the winning projects under the Faculty Mentored Undergraduate Research Award program (FURAP), and 3 posters of Oman Eco-House Competition.

6 continued research sessions on the updates and results of research proposals within the six research sectors.
Awarding the winners of the National Research Award

Announcing the first three winners of the Falling Walls Lab Competition

43 research posters funded by TRC were displayed at the research poster exhibition

6 posters of students were displayed

An exhibition for 8 of the institutions that support research and innovation

The Annual Research Forum in its 3 years

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendees</td>
<td>400</td>
<td>400</td>
<td>600</td>
</tr>
<tr>
<td>Visuals</td>
<td>12</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>Posters</td>
<td>43</td>
<td>23</td>
<td>32</td>
</tr>
<tr>
<td>Awardees</td>
<td>10</td>
<td>12</td>
<td>10</td>
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</tbody>
</table>
National Research Award 2016

For the third consecutive year, TRC awarded 10 research projects under the National Research Award (NRA).

<table>
<thead>
<tr>
<th>Research Led by PhD Holders</th>
<th>Sector</th>
<th>Research Led by Non-PhD Holders</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>EI</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>ICT</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>EBR</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>EHR</td>
<td>7</td>
</tr>
<tr>
<td>21</td>
<td>CBSS</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>HSD</td>
<td>7</td>
</tr>
</tbody>
</table>

- **43 research projects** received under the ‘best published research for the ‘Junior Researchers’ award category (Non-PhD Holders)
- **89 research projects** received under the ‘best published research from the ‘PhD Holders or Equivalent’ award category
- **132 research projects** received by TRC under the NRA
## Winning Research Projects under the NRA in 2016

<table>
<thead>
<tr>
<th>Research Title</th>
<th>Principal Investigator</th>
<th>Award Category</th>
<th>Research Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Arabic Language Teachers’ Level and the Role in Teaching Omani Values in Oman; from Students’ Perspective</td>
<td>Dr. Rayya Salim Al Mandhariya</td>
<td>PhD Holders or Equivalent</td>
<td>Education and Human Resources</td>
</tr>
<tr>
<td>Job Satisfaction of Nurses in a Regional Hospital in Oman: A Cross-Sectional Survey</td>
<td>Mohammed Abdullah Al Maqbali</td>
<td>Junior Researchers</td>
<td>Education and Human Resources</td>
</tr>
<tr>
<td>Fast Fringe Pattern Phase Demodulation using FIR Hilbert Transformers</td>
<td>Dr. Munther Gdeisat</td>
<td>PhD Holders or Equivalent</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>Micro-optical Analysis of Carbonated Water Injection in Irregular and Heterogeneous Pore Geometry</td>
<td>Dr. Nader Mosavat</td>
<td>PhD Holders or Equivalent</td>
<td>Energy and Industry</td>
</tr>
<tr>
<td>A novel Microfluidic Device for Estimating the total phenolic antioxidant level in honey samples using a formaldehyde potassium permanganate chemiluminescence system</td>
<td>Dr. Haider Al Lawati</td>
<td>PhD Holders or Equivalent</td>
<td>Culture, Basic and Social Sciences</td>
</tr>
<tr>
<td>Frankincense derived heavy terpene cocktail boosting breast cancer cell (MDA-MB231-) death (in vitro)</td>
<td>Dr. Faruck Lukmanul Hakkim</td>
<td>PhD Holders or Equivalent</td>
<td>Culture, Basic and Social Sciences</td>
</tr>
<tr>
<td>Two Pyrolsate Products from Omani Frankincense smoke: First Evidence of Thermal Aromatization of Boswellic acids</td>
<td>Prof. Ahmed Al-Harrasi</td>
<td>PhD Holders or Equivalent</td>
<td>Environment and Biological Resources</td>
</tr>
<tr>
<td>Genetic Diversity and Population Structure of Theileria Annulata in Oman</td>
<td>Salama Al-Hamidhiya</td>
<td>Junior Researchers</td>
<td>Environment and Biological Resources</td>
</tr>
<tr>
<td>Cognitive Profiles in Patients with Multi-infarct Dementia: An Omani Study</td>
<td>Prof. Samir Al-Adawi</td>
<td>PhD Holders or Equivalent</td>
<td>Health and Social Development</td>
</tr>
<tr>
<td>Serum Smd Autoantibody Proteomes are Clonally Restricted and Share Variable-region Peptides</td>
<td>Mahmood Al Kindi</td>
<td>Junior Researchers</td>
<td>Health and Social Development</td>
</tr>
</tbody>
</table>
Winners of the NRA 2016

Prof. Ahmed Al-Harrasi
Environment and Biological Resources

Mohammed Al Maqbali
Education and Human Resources

Dr. Nader Mosavat
Energy and Industry

Dr. Haider Al Lawati
Culture, Basic and Social Sciences

Dr. Rayya Al Mandhariya
Education and Human Resources
During its meetings in 2016, TRC Board reaffirmed the enhancement of TRC’s efforts in supporting research and innovation within the Sultanate. The topics covered included the draft of the National Innovation Strategy, the outputs of a research study on research obstacles in the Sultanate, in collaboration with Sultan Qaboos University, and the enhancement of TRC’s financial resources due to the current financial situation.

**International Advisory Board**

The International Advisory Board (IAB) of TRC held two meetings in 2016. The meetings focused on pressing issues such as the draft of the National Innovation Strategy, research obstacles in the Sultanate, the draft of the research centers management project, the Science and Technology Indicators project, as well as reviewing the international collaboration efforts between TRC and the various international research and academic institutions. The Members of the IAB visited the IPM and the TRC funded Research Chair of Nanotechnology for Water Desalination at Sultan Qaboos University, and the Agricultural Research Centre of the Ministry of Agriculture and Fisheries in Barka.

**Global Research Council Meeting**

TRC hosted the Regional Meeting of the Global Research Council for the Middle East and North Africa (MENA), with the main topics of discussion focusing on two main issues: the integration of the different disciplines, and acceleration of the integration process between humanitarian fields and applied sciences. The meeting focused on solar energy, reduction of energy consumption and other types of humanitarian studies, in addition to the role of women in research.
TRC’s various initiatives for the support of scientific knowledge during 2016 included the attendance at numerous specialized events and conferences that covered a range of different fields, such as energy and industry, information technology, cultural and social sciences, in addition to attending joint-committee meetings between the Sultanate and other countries.
Awareness Dissemination

TRC intensified its efforts towards achieving the goal of awareness dissemination of scientific research and innovation by keeping the public informed about its various activities and programs, using all the available media such as news reports, interviews, dialogues, as well as, tweets and messages on TRC’s social media channels.

- Continuous appearance in the local press
- Organizing awareness lectures
- ‘Dialogue with A Researcher’ radio program
- The ‘Scientific Insights’ newsletter
- Exhibitions that continue to spread awareness
- Utilizing Social Media to reach the largest possible audience

150 News Reports
5 Awareness Lectures
48 Radio Episodes
5 Exhibitions
TRC continued its efforts in qualifying and training its staff by providing them with a variety of training opportunities, such as on the job training, internal training and other initiatives. Seeking to develop its human resources, TRC adopted the online training initiative that accredits internationally recognized online training websites and provides trainees with training certificates.

**Activities for the Qualification and Training of Human Resources at TRC:**

- **24** Undergraduates trained at TRC
- **6** Meetings held by the Scholarships and Training Committee
- **9** No. of employees who have completed their studies
- **141** No. of employees who attended training courses
- **6** Granted conference attendance leave
- **4** Employees sent for training abroad
- **13** On the on job training
- **8** Contractual training courses and workshops
Programs and Projects

1. Innovation Park Muscat (IPM)
2. Oman Research and Education Network (OMREN)
3. The Survey on Science and Technology Indicators
4. Oman Virtual Science Library (OVSL)
The IPM project is located near Sultan Qaboos University at AlKhoud, and has reached 74% completion of its first phase.

### Main Developments:
- TRC Board in principle selected the company designated to the management of the IPM.
- Signing of an agreement with ‘Takatuf Oman’ and ‘Schlumberger Oman’ for the establishment of Oman’s Institute for Oil and Gas.
- Signing of an agreement for the establishment of a Research & Development Centre with Enhanced Oil Recovery LLC.

540,000 sqm is the total area of the IPM’s project.

The Business Incubation Program was prepared along with the IPM in which it presented many achievements, most notably: the preparation in terms of registration and graduation procedures, the description of incubator’s services, processing of legal documents and required policies, such as, the intellectual property and commercialization of the incubator’s project, and the IPM in general.
74% completion of the first phase
OMREN is a central part of a sustainable infrastructure that contributes to the emergence of an effective national innovation ecosystem. It provides the research and education community in the Sultanate of Oman with a common network and collaboration infrastructure dedicated and adapted to their needs. This will effectively contribute to the development of innovation, research, education and international e-collaboration. The project is initiated and supported by The Research Council through a strategic partnership with the national internet service provider OmanTel.

OMREN’s framework consists of a dynamic list of applications and services designed to enrich research and education sector activities. This includes but is not limited to:

- Dedicated high capacity private end-to-end circuits between research center and universities through MPLS.
- Internet Leased line (ILL) connection through local ISP.
- International connectivity through Internet2, GEANT and others.
- Video conferencing for e-collaboration.
- EduRoam.
- Research Information Management System for research proposals submissions.
- Unified campus management solution eCampus which covers SIS, LMS and ERP and this will be added later as per the project plan.

The project team is currently finalizing the MPLS connectivity to OMREN members, as well as, finalizing the international connection with Internet 2 and GEANT. The EduRoam is ready for implementation once the members are connected. This EduRoam service will allow researchers and students to get connected on their laptops and tablet PCs at all OMREN members and International EduRoam hosts with their own credentials. OMREN service will also be provided via a special OMREN SIM card to researchers and students beyond the labs and campus boarders.
The Survey on Science and Technology Indicators

TRC approved the Science and Technology Indicators (STI) project for 2014 and 2015, which showed that the percentage of expenditure on Scientific Research & Experimental Development formed 0.25% of the Gross National Income (GNI) in 2015, compared to 0.21% in 2014.

Statistics of this project also showed that the number of researchers per million inhabitants in 2015 comprised of 530 researchers. 2313 employees worked in the field of Scientific Research & Experimental Development in 2015, compared to 1696 employees in 2014.

Project Objectives:
- Collect data on the activities of scientific research & experimental development in the sultanate.
- Contribute to future planning.
- Measure the impact of scientific research & experimental development activities in future planning.
- Observe the research capacity of the sultanate.
- Participate in related international surveys.
- Contribute to the development of a national database project that is concerned with science and technology indicators.

Oman Virtual Science Library

The Oman Virtual Science Library project (OVSL) has witnessed an overall remodeling of its administrative, technical and financial aspects; and work is in progress with specialized companies to bring this new model into realization. In the project’s first phase, the services will be provided to the higher education institutions who signed joint agreements with Oman Research and Education Network (OMREN).

The Oman Virtual Science Library project aims to provide access to various sources and electronic information services, such as, peer reviewed journals, e-books, PhD and Masters research papers, and conferences papers.
During 2016, The Council faced financial challenges that resulted in the reduction of the budget. Various research programs were affected and a number of research programs have been financially suspended, such as the Open Research Grants Program (ORG), the Strategic Research Program, the Graduates Research Support Program (GRSP), the Researchers Incentives Program, the National Research Award (NRA), and the Faculty Mentored Undergraduate Research Award Program (FURAP).
Performance of Research Programs

During the last year, it has been evident that the budget reduction from The Research Council has had a negative influence on the performance of several research and supporting programs. However, TRC has continued to receive applications for the various research programs.
### Performance of Research Programs (2012 – 2016)

<table>
<thead>
<tr>
<th>Year</th>
<th>Open Research Grants</th>
<th>Strategic Research Grants</th>
<th>FURAP</th>
<th>Graduate Research Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Received Research</td>
<td>Funded Research</td>
<td>Ongoing Research</td>
<td>Completed Research</td>
</tr>
<tr>
<td></td>
<td>Increased from previous year</td>
<td>Decreased from previous year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>40</td>
<td>04</td>
<td>04</td>
<td>01</td>
</tr>
<tr>
<td>2013</td>
<td>58 ▲</td>
<td>04 ▲</td>
<td>89 ▲</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>28 ▲</td>
<td>03 ▼</td>
<td>41 ▲</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>62 ▲</td>
<td>03 ▼</td>
<td>97 ▲</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>28 ▲</td>
<td>0 ▼</td>
<td>70 ▲</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>73 ▲</td>
<td>02 ▼</td>
<td>161 ▲</td>
<td>26 ▲</td>
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<tr>
<td></td>
<td>10 ▼</td>
<td>0 ▼</td>
<td>99 ▲</td>
<td></td>
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<tr>
<td>2016</td>
<td>77 ▲</td>
<td>01 ▼</td>
<td>206 ▲</td>
<td>0 ▲</td>
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<td></td>
<td>0 ▼</td>
<td>0 ▼</td>
<td>39 ▼</td>
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<td>0 ▼</td>
<td>0 ▼</td>
<td></td>
</tr>
</tbody>
</table>
Research Statistics
Per Sector
(2012 - 2016)

Education and Human Resources Sector
- Received Research: 50
- Funded Research: 20
- Completed Research: 07
- Ongoing Research: 13

Energy and Industry Sector
- Received Research: 61
- Funded Research: 14
- Completed Research: 02
- Ongoing Research: 12

Information and Communication Technologies Sector
- Received Research: 47
- Funded Research: 08
- Completed Research: 01
- Ongoing Research: 07
في صميم الابتكار

at the heart of innovation
Faculty Mentored Undergraduate Research Award Program

In 2016, due to the lack of the financial resources, the number of funded research within this program has decreased, although interest from student applicants remained. From the 206 research projects received from 18 educational institutions, The Faculty Mentored Undergraduate Research Award Program (FURAP) of TRC approved the funding of 39 undergraduate research projects with a total cost of (Seventy-Three Thousand and Two Hundred Eighty-Two Omani Riyals) OMR 73, 282.

A total of 122 undergraduates were involved in the 39 funded research projects under FURAP in 2016. From the years 2013 to 2016, TRC has funded 249 research projects.

<table>
<thead>
<tr>
<th>Projects funded under the program in 2016 per sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Projects in the EBR Sector</strong></td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td><strong>Projects in the HSD Sector</strong></td>
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<tr>
<td>5</td>
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<tr>
<td><strong>Projects in the EI Sector</strong></td>
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<td>10</td>
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<td><strong>Projects in the EHR Sector</strong></td>
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<td><strong>Projects in the CBSS Sector</strong></td>
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<td>7</td>
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<tr>
<td><strong>Projects in the ICT Sector</strong></td>
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<tr>
<td>5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Mentored Undergraduate Research Award Program 2013 to 2016 (FURAP) during</th>
</tr>
</thead>
<tbody>
<tr>
<td>In terms of</td>
</tr>
<tr>
<td>Participating Institutions</td>
</tr>
<tr>
<td>Received Proposals</td>
</tr>
<tr>
<td>Funded Proposals</td>
</tr>
<tr>
<td>Participated Students</td>
</tr>
<tr>
<td>Funded Students</td>
</tr>
</tbody>
</table>
The Strategic Research Grants Program is one of the most important programs carried out by TRC, in collaboration with the concerned stakeholders. Since its inception, nine strategic research programs have been approved, with some already completed, such as the Road Safety Research Program, while work is still ongoing with the other projects, including the Social Observatory Research Program (SORP), and the Renewable Energy Research Program. Five other programs are currently in the establishment process.

01 Road Safety Research Program
02 Integrated Management for Dubas Bug Research Program
03 Social Observatory Research Program (SORP)
04 Renewable Energy Research Program
05 Strategic Program for Water Research
06 Omani Cultural Heritage Research Program
07 Red Algae Bloom Research Program (Red Tide)
08 Food Safety Research Program
09 Strategic Program for Chronic Diseases
Integrated Management for Dubas Bug Research Program

Dubas Bug Research Program is a strategic research project carried out by TRC in collaboration with the Ministry of Agriculture and Fisheries. Work is on-going on the five projects within this program, with a number of universities and colleges from inside and outside the Sultanate. A number of periodic reports for these projects were submitted, along with the process of creating cooperation with the International Center for Agricultural Research in the Dry Areas (ICARDA) to present a research proposal, titled 'Socio-economic study on Dubas infestation impact and influence of the cultural practices, in the Sultanate of Oman'.

Social Observatory Research Program

Main achievements of the program:
- Approval of the funding of 1 out of 5 completed proposals that were submitted from the Program’s Steering Committee.
- Study of the ‘Child’s Indicators’ presented by the DaveSat Organization to the Program’s Steering Committee.
- Modifying the 138 Social Indicators presented by Southampton University and filtering them by the program’s team and program’s steering committee to prove the final list of indicators.
- Forming a subcommittee to work on the Social Indicators Database.
- Forming a team of researchers to work on the ‘Youth Values in Oman’ research project.
- Organizing a series of workshops.
- Begin work on a Database of Researchers and Specialists in Social Sciences.

Omani Cultural Heritage Research Program

The Omani Cultural Heritage Research Program is part of TRC’s Strategic Research Grants Program in the Culture, Basic and Social Sciences Sector. It has been established to achieve a number of strategic objectives that are based on the concepts of values, identity and authenticity on one hand, and on the development and technology criteria on the other. It is based upon the importance of cultural heritage as a strategic tool with developmental and economic value.

A seminar was held in 2016 to discuss the founding document of the program, with participation of local and international experts. TRC has recently organized a workshop on ‘Cultural Heritage Strategic Program – Social Partnership’ at the Public Authority for Radio and Television, to discuss the partnership plan between the program and the private sector. The workshop discussed the project, ‘Tales and Myths Associated with the Historical Landmarks of the Sultanate’.
Strategic Program for Water Research

The Research Council (TRC), in collaboration with the Sultan Qaboos Higher Centre for Culture and Science and the Ministry of Education, announced in 2016 the opening of applications for the Research and Innovation Award in Water Science, within the Strategic Program for Water Research. Applications were opened on TRC’s website and winners will be announced in March, coinciding with the World Water Day. The award aims to encourage and promote the development of high-quality research and innovative ideas that address the needs of the local water sector.

Award Categories

- **Scientific Publication**
  - Young Researchers
    - First winner - OMR 2000
  - PhD Holders
    - First winner - OMR 2000

- **Innovation based**
  - Innovative Prototypes or Products
    - First winner - OMR 5000
    - Second winner - OMR 4000
    - Third winner - OMR 3000
  - The Young Innovator
    - First winner - OMR 1200
    - Second winner - OMR 1000
    - Third winner - OMR 800
    - Forth winner - OMR 500
    - Fifth winner - OMR 500
Commission Research Program

In collaboration with the Ministry of Tourism, ‘Tales and Myths Associated with the Historical Landmarks of the Sultanate’ research project has been established under the Commission Research Program. The program has been designed to support research directed to the study of certain topics of national importance and aims to address the Omani folktales that are related to tourism, architectural or natural landmarks in Oman, in order to increase awareness.

This national project aims to:

- Bring awareness to Omani heritage, and benefit from the research, institutions and community levels.
- Collecting and archiving the folktales.
- Support Omani researchers within the humanities, social and cultural fields.
- Show the role of research in sustainable development.
- Increase the number of beneficiaries of tourism, and improve tourist landmarks.

<table>
<thead>
<tr>
<th>Tales and Myths Associated with the Historical Landmarks of the Sultanate</th>
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<tbody>
<tr>
<td>In terms of</td>
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<tr>
<td>Research Team Members</td>
</tr>
<tr>
<td>No. of Narrators of Tales and Myths</td>
</tr>
<tr>
<td>No. of Historical Landmarks that have been documented</td>
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Adapting Towards Sustainable Development Program

This year, the Adapting Towards Sustainable Development Program focused on internal activities, in terms of the development of committees and work teams, restructuring of objectives with the Council’s stakeholders, as well as building positive relationships with local and global parties in order to provide a comprehensive vision for the sustainable development issues and their relevant economic, social, and environmental impacts. The program persisted to present practical recommendations designed to provide a scientific platform that supports decision makers in development planning, while supporting the various economic sectors towards sustainability.
Research Centers

The Research Centers Program was established by TRC to achieve research excellence in the fields of national importance, build research connections between the various sectors, and to enhance research capacity building. The program works on creating research centers of independent administrations, and to conduct the research in the different strategic fields. Accordingly, TRC has established the Oman Animal and Plant Genetic Resources Center (OAPGRC) and the Institute of Advanced Technology Integration (IATI) as part of the program.

Oman Animal and Plant Genetic Resources Center

OAPGRC has witnessed a number of developments and achievements, including the following:

OAPGRC headquarter project
A section of land in Wilayet Barka was allocated as the destination of the headquarters for the centre, while another section of land in Wilayet AlMusanaa was selected for agricultural fields. The initial design of the building and other facilities of OAPGRC is complete.

The Scientific Committees
In 2016, the scientific committees organized two sessions for each of the four main sectors of the center. The major projects of these scientific committees are:

- Assistance Program for Genetic Resources Innovation.
- Fungal Samples Collection at Sultan Qaboos University.
- Plant Biodiversity Strategy.
- Oman Socioeconomic Plants Conservation Platform.
- Genetic Resource Information Platform (GRIP) and Databases.
- Oman Socioeconomic Plants Conservation Strategy.
- National Database Platform.
- Arabian Gazelle Project.
Marine Debris and Waste Management

1. 9 Billion of Us: Enough Food for Everyone?

It's Getting Warm in Here

Coral Reef: Ocean Treasure

Crucial Critters: Insects Are Invaluable

What About a Career in Agriculture?
2016 has witnessed significant achievements through the three signed collaboration agreements with Helmholtz Association to play a leading role in fostering the creation of the scientific centers of IATI, through applied studies in the field of Water Resources Technologies and Renewable Energy Technologies.

**The first project** aims at the 'Establishment of a Research, Demonstration and Training Facility for Decentralized Wastewater and Sludge Management’.

**The second project** is concerned with ‘Submarine Groundwater Discharge (SGD) – Adaptation of an Autonomous Aquatic Vehicle for Robotic Measurements, Sampling and Monitoring’.

**The third project** focuses on developing ‘Continuous Hybrid Cooling Using Geothermal and Solar Heat Sources and Underground Storage Systems’.

IATI held two workshops in 2016, the first one was on IATI’s Wastewater Pilot Project, while the second one focused on the R&D site concept. Later in the same year, IATI and Helmholtz Association held a workshop on their joint Submarine Groundwater Discharge (SGD) project.

As part of the capacity building goal, a postdoctoral researcher was sent to Germany to be involved in research activities. In addition, PhD and MSc candidates have been sent to Germany to obtain their degrees in the framework of the project.
The Eco-house of Dhofar University will compete in the finals of the International Solar Decathlon Competition after taking part in the finals of the competition in Dubai in October 2015.

In 2016, the participating academic teams from the different higher education institutions in the Sultanate carried out important amendments and improvements to their eco-houses in order to ensure that they work in a scientific and practical manner, as per the competition’s standards. In addition, modern devices have been installed to monitor the consumption of electric power and the transmission of thermal energy, humidity and water movement on a regularly updated basis.

The eco-houses served as scientific laboratories and were used by researchers and students for scientific and research studies in environmental preservation. Many students received training opportunities and as a result, a number of small enterprises have been established in this field. The eco-houses also provided scientific solutions to many of the environmental and sustainable development issues in Oman.

The eco-house of Dhofar University qualified for the finals of the International Solar Decathlon Competition in 2018 after taking part in the competition’s qualifiers which was held in Dubai in October 2015.
Innovation Support

Major Challenges:
- Dispersion of the policies required for the innovation system.
- Delay of implementation of the measures at a policy level, as well as, having a risk-averse society.
- Lack of interest from the industry sector.
- Weaknesses and deficiency in the infrastructure.
- Non-adaptation of pioneering education, entrepreneurship and innovation as part of basic education.
- Lack of independent prototyping institutions ‘Incubators’.
- Lack of entrepreneurship skills among the Omani youth.

1. National Innovation Strategy
2. Innovation Capacity Building
3. Individual Innovation Competition
The National Innovation Strategy (NIS)

This year, TRC embarked on developing the National Innovation Strategy (NIS), in collaboration with various innovation institutions in the Sultanate. Four main pillars have been determined for the strategy and each is being developed by a specialized team. The four pillars are:

- Human Capital Resources
- Intellectual Property and Technology Transfer
- Economy Diversification
- Institutional Communication

A time table has been allocated that includes a number of meetings and workshops, to help achieve the four mentioned pillars over three phases:

- Activate local initiatives and strengthen institutional and community communication.
- Enable innovation and data by providing financial, technical, and logistical support.
- Enable the comprehensive national system by drafting innovation policies in a way that achieves national harmony.

The project plan is expected to be completed and approved in 2016, by the Grand Steering Committee and then forwarded to the competent authorities for the approval of the implementation policies.

Innovation Capacity Building

During 2016, TRC enhanced the concept of innovation amongst the various government institutions that are involved in the National Innovation Strategy. This has been achieved by organizing a workshop titled, ‘Lead Innovation’. The workshop aimed to enhance participants’ capacities by enabling them to the best practices of innovation operations, qualifying them into supplying creative services and achievements, and also to provide them with skills and behaviors that support creativity and innovation.
Individual Innovation Competition

Although the Individual Innovation Competition has not been announced in 2016, due to the financial challenges, TRC continued to follow-up the eight innovative winning projects of the competition from its first year in 2015. The innovators faced a number of challenges, of which the most significant being establishing institutions that help with the prototype development stage. In addition, some innovations lack the innovative, technical and linguistic skills.

Despite this, through the support and consultation services provided by the Council, some innovators managed to reach advanced stages in transforming their innovative ideas into products. However, two innovators withdrew from the competition after the first stage due to disagreements with their prototype development companies, and also due to not being able to meet the competition’s conditions.

Through the Innovation Hub (I-Hub), TRC aims to activate the Individual Innovation Competition to support Omani innovators and enable them to transform their ideas into products, services and technologies that can be commercialized and consequently, earn financial returns through the establishment of Small and Medium Enterprises. The competition aims to foster entrepreneurship driven by science, technology and innovation, as well as elevate the Sultanate’s position in the Global Competitiveness Index (GCI).

<table>
<thead>
<tr>
<th>Project</th>
<th>Updates / Stages</th>
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<tr>
<td>First Project</td>
<td>fourth stage / commercialization and marketing. The product of this project is expected to be marketed in 2017.</td>
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<tr>
<td>Second, third, fourth and fifth projects</td>
<td>third stage / initial prototype development.</td>
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<tr>
<td>Sixth Project</td>
<td>second stage / initial prototype development.</td>
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<tr>
<td>Seventh and Eighth Projects</td>
<td>Withdrawn from the competition at various stages due to a disagreement with their prototype development companies, and failure to comply with the competition’s conditions.</td>
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