His Majesty Sultan Qaboos bin Said
Contents

- Foreword 6
- Message 8
- Vision, Mission & Objectives 10
- About TRC 11
- Research Programs 14
- Innovation at All Levels 46
- Awareness & Knowledge Transfer Programs 54
- IT Support Programs 60
- Looking Forward 68
Foreword

It is with great pleasure that I present this annual report on behalf of everyone who has contributed to the work, and indeed, the impact of The Research Council (TRC) since its establishment in 2005.

Since I took on the role of Chairman of TRC I have been greatly impressed by the commitment and enthusiasm of the TRC Team; their dedication has played no small part in enabling us, as an organization, to make significant strides towards the attainment of our vision.

The last 12 months have seen many important developments for TRC. Major milestones and a source of pride for TRC have been: the development of the Road Safety and Dubas Bug Research Programs; the launch of the National Chair of Nanotechnology for Water Desalination at Sultan Qaboos University; the completion of the development of the strategy for the Animal and Plant Genetic Resources Center and the development of plans for a new Science Park in Al Khod, adjacent to Sultan Qaboos University. Moreover, The Industrial Innovation Center, inaugurated in February 2010, continues to make significant progress - championing innovation in Oman’s manufacturing sector and supporting entrepreneurs.

Driving the National Innovation EcoSystem is central to our mission and in this regard we are delighted with the work we are carrying out in innovation and entrepreneurship – particularly, the Education Innovation Assistance Program, a two-year pilot project set-up in collaboration with the Ministry of Education. Under its auspices eight teachers have been trained who, over the course of the project, will work with approximately 2,000 students from grades seven to ten - introducing our youth to the enterprise culture. Indeed, reaching out and interacting with the nation’s youth is of significant importance to TRC.
2011 has seen research grow and flourish in Oman and we view our researchers as a vital national asset. TRC is proud of the role its various funding programs have played in this. They are:

- The Open Research Grants Program
- The Strategic Research Grants Program
- The Research Chairs Program

Another important development for us this year has been the successful implementation of TRESS – our very own electronic system for research proposal management.

The dissemination of knowledge is key to everything we do. We not only encourage and facilitate the sharing of knowledge between researchers and institutions domestically, regionally and internationally but also share information with the public and educate them of the important role that research and innovation have to play at so many levels in their lives.

In this regard, we have hosted a variety of lectures, seminars and workshops and maintained a strong presence in print and online media.

I hope you agree with me that the accomplishments of 2011 are notable and augur well for what is to come in 2012

Shihab bin Tariq Al Said
Chairman
TRC
TRC has the specific goal of translating scientific and technological achievements into real benefits for society. They are benefits which will drive progress, sustainable economic growth and prosperity; they will lead to increased entrepreneurship and support industry. The importance of this goal has been emphasized by the global economic environment that has prevailed in 2011.

In this regard, TRC has developed a National Research Strategy which is intrinsically linked to the sultanate’s development plan - Vision 2020. The Strategy highlights the following areas as being of challenge for us both as a nation and as an organization:

- Culture & Basic Sciences
- Energy & Industry
- Environment & Biological Resources
- Education & Human Resources
- Health & Social Services
- Information & Communication Technology

It is our priority not only to power progress but also to make a real impact.

Central to the Strategy is the goal of improving all aspects of life in Oman and setting up a system that is responsive to national and international needs – one that fosters innovation and scientific excellence and makes a positive contribution to society.
The main themes of the Strategy are:

- Building greater research capacity
- Achieving research excellence in fields of national importance
- Creating a supportive and stimulating environment for research
- Disseminating knowledge and utilizing academic research

As one of the region’s leading research organizations, TRC is well-placed to have a significant impact on research and innovation domestically, regionally and internationally whether through the support of facilities, membership of international scientific organisations, publication or the efforts of the researchers we support.

TRC is determined to use its resources to foster and produce the best, most original science, research and innovation possible, to do justice to the great responsibility with which it has been entrusted and contribute to both the development of our nation and the greater good of the global society.

In this report we highlight the great strides we have made in 2011 and entreat you to celebrate our achievements – the foundations on which many more will be built.

Dr. Hilal bin Ali Al Hinai
Secretary General
TRC
Vision

- Make Oman a regional hub for innovation and a leader in new ideas, products and services
- Build the largest research capacity in the region
- Foster excellence in selected fields of national importance
- Build a research system that responds swiftly to domestic social and economic needs

Mission

To create an innovation ecology that is responsive to local needs and international trends, fosters social harmony, and leads to creativity and excellence.

Objectives

TRC has four basic objectives:

- Build research capacity
- Achieve research excellence
- Develop research networks and knowledge transfer
- Create an environment that encourages and stimulates research

Our vision, mission and objectives underpin TRC’s work and activities in ensuring the future competitiveness of Oman. Since its establishment TRC has created a framework from which to expand the economic, social, international and scientific benefits research can deliver to Oman – a goal that is at the heart of our mission, vision and objectives.

Indeed, our mission, vision and objectives recognise the contribution of research to society, the key role of innovation and the benefits that flow from that research and innovation.

TRC’s task is to ensure that we create an environment conducive to research and innovation, build the capacity to support and power it and are prepared for and receptive to the benefits that ensue.
About TRC

Driving a diverse portfolio of world-class research and innovation for Oman are core functions of TRC. We are responsible for capacity building and developing the national innovation ecosystem – prerequisites for advancing the sultanate’s work in this vitally important area.

We are responsible for the support and funding of a growing number of researchers. Working with, and through, a variety of partners from ministries and universities to commerce and industry, we promote research and innovation across the sultanate and are active in knowledge transfer to the broader community.

TRC works with organizations that include Sultan Qaboos University; the Ministry of Education; the Ministry of Higher Education; the Ministry of Oil & Gas; the Ministry of Commerce & Industry; the Ministry of Agriculture & Fisheries; the Information Technology Authority; the Public Establishment for Industrial Estates; Knowledge Oasis Muscat; and a host of domestic tertiary institutes and creates a community through which they can align their efforts, explore synergies, create value and optimise commercial opportunities.

While research has many rewards, we strive, in particular, to extract the maximum benefit for society from our investment in research. This includes attracting young people into science, helping to address the multiple challenges facing the world today in relation to energy, culture, environment, health, ICT, education and promoting innovation and new ways of working with the business community to bring the sultanate sustainable economic prosperity.

TRC works nationally and internationally with government, academia, business and industry to maximise the potential of and for innovation.
Achievements
2011
Research Programs
One of TRC’s primary functions is the funding of research. Through this TRC helps create solutions for national challenges, train new researchers and develop new knowledge and technologies.
Open Research Grants Program

The Open Research Grants Program allocates funds to small and medium-sized research in areas highlighted as priorities in the National Research Strategy. They are:

- Culture & Basic Sciences
- Energy & Industry
- Environment & Biological Resources
- Education & Human Resources
- Health & Social Services
- Information & Communication Technology

At the end of 2011 the Program completed its fifth annual cycle. In total, over its four years of operation, it has received more than 133 proposals from different sectors and from a range of institutions. All proposals were considered by committee and reviewed according to an international standard review system.

In 2011, the Program was divided into two parts:

- Call Cycle 1: January 2011 to May 2011
- Call Cycle 2: June 2011 to December 2011

<table>
<thead>
<tr>
<th>Call Cycle</th>
<th>Submitted</th>
<th>Funded</th>
<th>Total funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Cycle 1</td>
<td>25</td>
<td>13</td>
<td>RO1,333,918</td>
</tr>
<tr>
<td>Including</td>
<td></td>
<td></td>
<td>6 PhDs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 Masters Degrees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Call Cycle</th>
<th>Submitted</th>
<th>Funded</th>
<th>Proposed total funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Cycle 2</td>
<td>16</td>
<td>Under Process</td>
<td>RO2,226,729</td>
</tr>
<tr>
<td>Including</td>
<td></td>
<td></td>
<td>6 PhDs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 Masters Degrees</td>
</tr>
</tbody>
</table>

Funding was distributed across the six sectors.
Strategic Research Grants Program

The Strategic Research Grants Program allocates medium to large grants for planned strategic research. By promoting project and program based proposals which respond to strategic needs, the Program ensures research relevance; focus; quality and excellence.

The Program currently concentrates on two main projects, both deemed of national importance:

- The Road Safety Research Program
- Integrated Management of the Dubas Bug Research Program
Figure 1: Total Number of Proposals Submitted 2011 by Research Area

- Environment & Biological Resources: 10
- Information & Communication Technology: 4
- Culture & Basic Sciences: 5
- Health & Social Services: 12
- Energy & Industry: 3
- Education & Human Resources: 7
Figure 2: Total Number of Proposals Approved 2011 by Research Area

- Environment & Biological Resources: 9
- Information & Communication Technology: 5
- Culture & Basic Sciences: 1
- Health & Social Services: 5
- Energy & Industry: 2
- Education & Human Resources: 4
Road Safety Research Program

A collaboration between the public and private sector, the Road Safety Research Program (RSRP), with an annual budget of RO500,000, encourages scientific research and national capacity building in road safety. TRC provides the platform and key members to help drive RSRP’s activities.

Every year worldwide, road accidents kill nearly 1.3 million people and injure between 20 to 50 million more. Oman has one of the highest traffic incidences worldwide.

Over 6,000 men, women and children lost their lives in car crashes in Oman between 2000 and 2008. Seventy thousand were injured and some disabled for life. According to the Royal Oman Police (ROP), 42 per cent of the dead and injured were young people under the age of 25.

Road fatalities in Oman have increased from 499 in 2001 to 820 in 2010. The statistics in 2011 are even more alarming - 1,051 fatalities were recorded and injuries totalling 11,322 cases which is considered very high based on the UN average.

In 2011, Oman established several initiatives to reduce road traffic incidents and crashes in line with the UN Resolution on the Decade of Action for Road Safety. The Road Safety Research Program under the auspices of TRC launched a call for proposals on 15 May 2010. TRC advocates the use of scientific research-based methodology to provide data and information to aid decision makers in formulating policies, regulations, programs and action plans to reduce road crashes in the sultanate.
National Road Crash Database
One of the RSRP’s most important elements is the creation of a National Road Accident Database (NRAD). A task force has been established to oversee the development of a National Road Crash Database and partners have been engaged to collaborate on the project.

The main objective of the project is to implement a web-based GIS enabled database which has the following features:

• Location referencing (e.g. GPS, GIS)
• Incorporating existing databases relevant to road safety
• Visual analysis

The software used for the project will collect, store, analyse and report road accident data, helping ROP and other agencies to capture and analyze information in order to identify and tackle road safety problems.

Why A Road Accident Data System Is Needed
Road traffic accidents pose a serious challenge for Oman. Indeed, every year nearly 900 people die on the sultanate’s roads with a further 20,000 requiring hospital treatment.

Accurate and reliable data is required to tackle road safety. Acting as a central repository of crash data and statistics, the information contained in the database will assist in the formulation of a road safety strategy with specific targets and appropriate intervention. It can also be used to raise general awareness of road traffic safety issues.
**Main Objectives & Goals**

The main objective of the RSRP is to promote scientific research and build national capacity on road safety which will support the application of evidence-based solutions to combat road traffic incidents (RTI) in Oman.

The goals of the program are:

- Encourage domestic and international researchers to undertake research proposals aimed at reducing the problem of traffic accidents in Oman.
- Increase research capacity in road safety by supporting graduate students working on submitted research proposals.
- Provide scientific research-based results to the relevant authorities to help formulate preventive measures and strategic plans to reduce the problem of traffic incidents and injuries.
**Steering Committee Activities and Progress in 2011**

An RSRP Steering Committee was set up in 2009 to:

- determine research priority areas;
- ensure research proposals are of high scientific quality;
- meet international research standards.

Chaired by the Royal Oman Police (ROP), the Steering Committee is comprised of 12 members from various Omani ministries and organizations.

In 2011, the Steering Committee achieved several key milestones, including receiving a total of 34 pre-research proposals, seven of which were submitted and three accepted.

The Steering Committee met four times in 2011 to:

- review research proposals;
- agree on the required terms of reference to commission research;
- share information on road safety through meetings, seminars and media coverage.

**Accepted Full Research Proposals**

The following full research proposals have been accepted:

- **Prevention of Accidents and Injuries on the Road (PAIR)**
  
  Strengthening Preventive Efforts in Oman
  
  Karolinska Institute, Sweden & Sultan Qaboos University.

- **Novice Driver Safety**
  
  Queensland University of Technology CARRS, Australia & Sultan Qaboos University

- **Heavy Vehicle (Truck) Research**
  
  Queensland University of Technology CARRS, Australia & Sultan Qaboos University
Figure 3: Road Safety Research Proposals Submitted to TRC

- Total Pre-Proposals Submitted: 34
- Rejected: 7
- Full Proposals Submitted: 23
- Approved: 3
- Full Proposals Under Review: 1
Co-operation with International Organisations

- Reinforcement of road safety co-operation between Traffic Safety Institute and Queensland University.
- Investigation of Municipality data for the development of a Road incidence Database for the sultanate in collaboration with Traffic Research Laboratory, UK
- Cooperation with Global Road Safety Partnership (GRSP) to examine possible benefits from their road safety experience and knowledge
- Cooperation with New Zealand Traffic Agency

Overseas visit to New Zealand

A visit to New Zealand was conducted in July 2011. A meeting was held with representatives from Headlight International, specialists in Road Safety Advertising Consulting, Wellington; New Zealand. The development of an effective road safety advertising program that will deliver results was discussed as was research on road safety, legislation and databases.
**National Activities: The First Regional Road Safety Youth Assembly**

Held 26-28 February 2011 and hosted by the Road Safety Association, the event was organized by the Omani Youth Ambassadors for Road Safety with the support and oversight of Youth for Road Safety (YOURs) and the Global Road Safety Partnership (GRSP) in co-operation with the Middle East and North Africa Road Safety Partnership (MENARSP).

Main outcomes included:
- Participants learned how to advocate for Youth and Road Safety issues
- Sharing of road safety knowledge and experiences from other countries
- Acknowledgement of the importance of capacity development
- Identification of current skills and capacities and the possibilities for improvement
- Worked on research methods for road safety projects
- Agreement to form a regional network feeding into the global youth network of YOURS
- Adoption of the 11 recommendations of the Muscat Youth Declaration for Road Safety

**Traffic Safety Expo**

The exhibition was held 18-20 October, 2011. The aim of the participation in this exhibition was to spread awareness of RSRP and provide detailed information on the programs to the public.
Integrated Management of the Dubas Bug Research Program

Developing Integrated Pest Management for Dubas Bug Ommatissus lybicus de Bergevin, in the Sultanate of Oman.

The Dubas bug causes serious plant disease and great damage to palm trees in the sultanate, as well as in other countries around the world. The first incidence of the Dubas bug in Oman was recorded in 1962.

Due to the increasing problems caused by this insect, and to avoid the use of harmful insecticides, Integrated Pest Management (IPM) was included in the Strategic Research Grants Program by TRC. Its aim is to find a safe, environmentally friendly and effective solution to the Dubas problem.

The Committee overseeing the research program is headed by His Excellency, the Under Secretary for the Ministry of Agriculture and Fisheries. The Committee is composed of officials from:

- Ministry of Agriculture & Fisheries;
- Sultan Qaboos University;
- TRC;
- Ministry of Environment & Climate Affairs;
- Ministry of Health;
- Diwan of Royal Court Affairs.
A call for pre-proposals was launched in January 2011 on www.trc.gov.om. Additionally, several presentations for researchers and specialists were conducted in Oman, Brazil and the United States to publicize the Program’s objectives and themes and explain how research proposals operate.

In 2011, the Steering Committee received 20 pre-proposals, 11 of which have been approved. Ten full-proposals have been submitted and six have been revised by the Steering Committee and sent to external reviewers.

The Steering Committee has reviewed the reports of three full-proposals which investigate the following themes:

• The Ecology & Biology of the Dubas Bug and its Biological Control
• Insecticide Screening & Resistance Management
• Improved Biocide Application & Evaluation
• Socioeconomics & the Implementation of Integrated Pest Management

The Steering Committee met three times in 2011 to review research proposals and share information on the Dubas bug through meetings, seminars and media coverage.

**Accepted Research Proposals**

The following full research proposals have been accepted:

• Status of Insecticide Resistance:
  Tolerance and Susceptibility of Dubas bug Ommatissus lybicus De Berg., Populations to Insecticides in the Sultanate of Oman.
  Ministry of Agriculture and Fisheries, Sultanate of Oman.
• Conception of an Integrated Management Strategy for Ommatissus lybicus De Berg., in the Sultanate of Oman.
  The National Institution for Agriculture in Tunisia.
• Long Term Sustainable Management of Dubas Bug in Oman:
  A Collaborative and Co-ordinated approach.
  Queensland University, Australia.

In 2012, it is expected that TRC will approve a number of domestic and international research projects that fall within the objectives and themes of the Program. The Steering Committee will follow-up on the implementation of the Program and evaluate the agreed projects.
Figure 4: Integrated Management of the Dubas Bug
Research Proposals Submitted to TRC

- Full Proposals Submitted: 21
- Total Preproposals Submitted: 3
- Full Proposals Under Review: 10
- Rejected Proposals: 9
- Full Proposals Approved: 7
Research Chairs Program

As part of Oman’s National Research Strategy, the Research Chairs Program allocates research funds for long-term projects to researchers at higher education and research institutions to develop research projects and programs in specific disciplines.

The objectives of the Research Chairs Program are to:

- Provide financial resources to set up research chairs for high-quality projects relevant to the National Research Strategy
- Develop domestic research capacity and excellence in selected areas
- Advance the frontiers of knowledge through focused research in identified fields or problem areas
- Strengthen and improve the capacity of domestic higher education institutions to generate and apply new knowledge
- Assist domestic higher education institutions in setting up postgraduate programs
- Offer an attractive research career track for highly skilled researchers
The National Chair of Nanotechnology for Water Desalination at Sultan Qaboos University

TRC has approved a request from Sultan Qaboos University (SQU) to establish a research chair in nanotechnology for water desalination and an international expert has been appointed to the chair.

The chair leads a program of research in nanotechnology for water desalination at SQU and provides research leadership, including: strategic planning; project development; planning and management; supervision of research staff and postgraduate students.

The chair’s team are interdisciplinary, comprising of existing SQU faculty and staff. Resources have been made available to appoint postdoctoral fellows, additional researchers and postgraduate students to compliment skills already available at the University.

The team maintains strong domestic as well as international collaboration with universities, research organizations and the private sector.

The chair holder has been appointed and the agreement with SQU signed. Moreover, a Steering Committee has been established to assure the efficiency and relevance of the chair’s activities.
The Animal & Plant Genetic Resources Center

Following a directive by the Cabinet of Ministers, a Steering Committee was set up in 2010 to formulate a comprehensive and integrated strategy for an Animal and Plant Genetic Resources Center (APGRC).

The framework for the APGRC strategy was designed by a team of domestic and international experts working with stakeholders. Its mission was defined by the Steering Committee, in conjunction with domestic and international experts and stakeholders.

Discussions were organized to develop the Center’s strategy; they took place over a 12-month period and included a variety of public events as well as an international workshop and conference plus a final workshop.

- An initial three-day workshop was held in January 2011 and was attended by 150 officials from government agencies as well as public and private sector organizations. Five international experts and 16 domestic speakers led the discussions and presented various options and experiences.

- A two-and-half-day retreat was held in February 2011 at which 22 Oman-based experts helped create a common vision for the Center.

- The Final workshop, held 31 May – 1 June 2011, provided a platform for Omani stakeholders to review and amend the proposed strategy for the establishment of the Center.
Site visits to the following international genetic resources centers in the United States, Europe and Asia were organized:

- North Central Regional Plant Introduction Station
  Ames, Iowa, USA
- National Center for Genetic Resource Preservation
  Fort Collins, Colorado, USA
- National Germplasm Resources Laboratory
  Beltsville, Maryland, USA
- Systematic Mycology & Microbiology Laboratory
  Beltsville, Maryland, USA
- NordGen Plant
  Alnarp, Sweden
- NordGen Farm Animals
  NordGen Forestry, Ås, Norway
- Malaysian Genomic Research Centre
  Kuala Lumpur, Malaysia
- Malaysian Biotechnology information Centre
  Kuala Lumpur, Malaysia
- Bioversity International
  Kuala Lumpur, Malaysia
- National Genebank, Aegean Agricultural Research Institute
  Izmir, Turkey

The Center will exploit, in a sustainable fashion, the unique genetic resources of Oman and address the threats to local resources as well as meet the challenges faced by various organizations. Moreover, the Center will assist in building greater sectoral co-ordination, capacity building and funding.
The APGRC Mission
To promote the recognition, sustainable exploitation and evaluation of the genetic diversity inherent in Oman’s animals, plants and micro-organisms as a natural heritage resource.

The Center is designed to be a collaborative organization for advancing the sustainable use of animal and plant genetic resources through education, research and innovation.

The APGRC Vision
In the coming decade, the APGRC will develop as a collaborative hub for all animal and plant genetic resource activities. It will promote the sustainable use of knowledge across economic sectors and social segments and create value from world-class research and practical innovation.

This national collaborative effort will be open to the world of international science and will focus on building recognized domestic capacity in the field of genetic resources.

The final draft document of the Center’s proposed strategy was reviewed by international experts as well as discussed by the Steering Committee before being approved for submission to the Cabinet.

To date, two programs have been launched by the APGRC:

- The Co-ordination & Dialogue Platform Program
- The Public Awareness Program

As part of these programs several events are being planned including activities for school children. Committees have also been set up to advise on the Center’s facilities and operation.

International Collaboration
Representatives of the APGRC have participated in:

- Third Inter-sessional Working Group on Intellectual Property & Genetic Resources (IWG 3), Geneva, Switzerland
- Agrobiodiversity Conservation Toolkit Workshop, Lyme Regis, UK
Health & Social Services

The mandate of TRC in general, and in the Health and Social Development Sector (HSS) in particular, is to undertake initiatives that will enhance the quality of health research in order to improve the effectiveness and efficiency of healthcare delivery. Indeed, HSS is committed to making positive progress towards achieving the targets of the National Research Strategy.

The mission of HSS is to build research capability in responsive, evidence based and cost-effective healthcare system that:

- promotes healthy lifestyles;
- encourages preventive medicine and ensures delivery of it to all citizens;
- develops collaborative and multi-disciplinary research in genetics, nanotechnology and biotechnology.
The vision of HSS, as detailed in the National Research Strategy, is to reach excellence in:

- preventive medicine;
- healthcare policy and systems research;
- make Oman a regional hub for a global and virtual hub-and-spoke system of healthcare research;
- become a regional research hub for multi-disciplinary fields including genetics and biotechnology.

To achieve this mission and vision, three main goals in the HSS strategy were targeted:

- research capacity;
- research excellence;
- knowledge transfer.

Research capacity in HSS can be improved by developing:

- graduate programs in medical sciences and professional studies; public health; preventive medicine; healthcare policy; delivery; economics and management; environmental and occupational health.
- graduate science related to nanotechnology; biotechnology; remote diagnostics; telemedicine; bioinformatics; biomaterials; gene therapy; genomics; proteomics and related fields.
- graduate programs with health informatics; evidence based studies; health insurance and health promotion.
Similarly, to achieve research excellence, there are three main focuses:

- build a centre for epidemiological studies and disease control;
- build a centre for biotechnology and genetics research;
- build virtual research communities.

Finally, knowledge transfer can be achieved by:

- acquiring rights to multi-disciplinary scientific platforms essential for conducting cutting edge research in biotechnology, nanotechnology and genetics and transferring these to local universities and research centres;
- supporting local non-governmental organizations in research on community health research and delivery issues;
- aligning healthcare research with community needs, particularly for special needs groups;
- creating incentives for multi-national corporations to conduct research in Oman and as well as outsource to domestic research organizations.
Social Services
The Social Development Sector (SDS) is committed to enhancing the quality of life in Oman and to developing the full potential of each individual, group and community in our society.

The National Research Strategy outlined the primary objectives of SDS, which are to provide:

• social security;
• wages from social security and general assistance to people in need;
• A societal ‘safety net’ to limit the spread of negative phenomena such as begging and delinquency;
• care for people with special needs;
• support through centres for the rehabilitation of the disabled;
• support through centres for children with disabilities;
• services to the disabled through a National Council;
• support to the disabled with sports facilities and programs;
• assistance to social programs that support the disabled;
• assistance to women’s issues and support charities;
• support to help the position of women within society;
• support for charitable institutions, social clubs and social development groups throughout the sultanate.
2011 Activities
To increase awareness about TRC and HSS several visits and lectures took place in 2011. These included:

• 5 September 2011: Two visits, one to the College of Art (Department of Social Sciences) and the second to the College of Nursing. During these two visits the role of TRC and the opportunities to obtain funds were explained.
• 6 September 2011: Participated in preparing the International Conference on Health System 2050, organized by the Ministry of Health (MoH) to be held in Oman 1 May 2012. HSS was represented by the Director of the Sector in collaboration with SQU and outlined the role of studies and research in the health system.
• 2 - 5 October 2011: Participated in the Diabetes Symposium, Kuwait, Dasman Institute. HSS presented a paper entitled: “Type2 Diabetes Mellitus in the Sultanate of Oman Epidemiology & Research: Immune Modulation of Type 2 Diabetes.”
• 10 October: Meeting with the General Director of Planning & Studies at the Ministry of Social Development. HSS introduced TRC to the Ministry and encouraged stronger links with TRC vis-a-vis TRESS.
• 15 October 2011: Meeting with Dr. Abdullah Al Futaisi, Executive President, Oman Medical Specialty Board (OMSB), Discussed future collaboration between HSS and OMSB.
• 18 - 20 October: Participated in the Road Traffic Exhibition Organized by ROP.
• 24 October 2011: Presented at Khoula Hospital: “Intoduction to TRC: Opportunities for Funding Your Research.”
• 24 - 26 October 2011: Mrs. Kawther Al Belushi, Research Analyst at HSS participated in a workshop “Investments in University Research & its Role in Social Development.”
• 26 October 2011: Presented at the SQU College of Nursing: “Introduction to TRC: Opportunities for Funding Your Research.”
• 20 - 22 November 2011: Attended the Qatar Foundation Annual Research Forum Conference. HSS participated in a panel discussion entitled: “Challenges in Research in GCC Counties.”
• 29 November 2011: Participated at 1st International Nursing Conference at SQU. HSS presented: “Research Funding in Oman.” The conference was partially sponsored by TRC.
Figure 5: Open Grant Projects Submitted to HSS

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Submissions</th>
<th>Approved</th>
<th>Under Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>10</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>10</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
Figure 6: Institutions Funded by TRC via the Open Grant Program
Innovation at all Levels
TRC is committed to the advancement of both research and innovation and recognizes the interlinked relationship between the two as well as the fundamental and transformational role these play in the advancement of Oman’s economic, social and environmental growth and development. With this in mind, we work on an on-going basis to align research and innovation more closely with enterprise so the sector can better leverage the rich commercial opportunities for the sultanate. We are also dedicated to improving research and innovative capacity both socially and institutionally as part of TRC’s mandate.
The Industrial Innovation Assistance Program

The Industrial Innovation Assistance Program strategy was developed by TRC and activated jointly with the Ministry of Commerce and Industry. Through competitive funding the program builds research and innovation capacity to meet the challenges of industry and commerce.

The objectives of the program are to:

- Encourage small and medium-sized organizations to adopt research and innovation tools to develop their scope of work
- Provide academic researchers with opportunities to deal with and solve industrial and commercial problems and challenges
- Develop a research and innovation community network so investors and owners of innovative projects in the private sector can share knowledge and expertise and exchange ideas
The Industrial Innovation Centre

In 2010 this program evolved into Industrial Innovation Centre (IIC) as a joint initiative between TRC, the Public Establishment for Industrial Estates and the Ministry of Commerce & Industry. Situated on Rusayl Industrial Estate, the IIC is well-placed to play a pivotal role in the growth of Oman’s industry. The IIC is involved in projects ranging from bringing hi-tech, environmentally friendly oil cleaning products to market to optimizing industrial production processes.

Over the past two years the IIC has successfully funded 12 R&D projects at a total cost acceding RO638,754 of the total allocated budget of RO1,270,100.
Education Innovation Assistance Program

The Education Innovation Assistance Program (EIAP) aims to develop innovative education in the public and private education sectors and enhance the research skills of students. The goal is to develop the skills necessary for successful entrepreneurship in the youth of Oman. The program is developed and funded by TRC at a total cost of RO1.1 million and conducted in collaboration with the Ministry of Education.

This pilot project was launched in five schools where each will be equipped with an incubator to create the necessary innovation and entrepreneurial environment that would enable students to learn, acquire and practice their innovative talents and skills. Eight teachers were selected and went under appropriate training to implement the program and it is expected that up to 2,000 students from grades seven to ten will benefit from this two year pilot project.
The Innovation Hub Project

The Innovation Hub project is intended to create an enabling environment and will be the innovation nucleus for the nation. The Innovation Hub’s strategy has been developed and approved for implementation with a total budget of RO5,615,562 for a two year pilot project. The project is designed to support, develop and drive Oman’s innovation ecosystem as well as help build capacity to support it.

The Innovation Hub oversees four major innovation and entrepreneurship programs:

- Community and Individual Innovation Assistance Program
- Academic Innovation Assistance Program
- Commercialization Program
- Linking Oman

The Innovation Hub and its four programs are expected to be functional within the first quarter of 2012 with the focus on the practical aspects of bringing research to life. It will enhance contact and facilitate the flow and exchange of ideas between the public, academia and business; develop students’ and researchers’ entrepreneurial skills and take research output down the value-chain and apply it to the industrial and commercial world.
Social Observatory Research Program

The National Research Strategy for Social Development, developed by TRC, highlighted the need for research examining:

- changes in Omani society;
- social problems facing the sultanate;
- ways to tackle these challenges.

With this in mind, the Social Observatory Research Program was established to examine these issues. Research areas expected to feature in the research program are:

- poverty;
- physical disability;
- social trends;
- marriage;
- youth behaviour.

The Social Observatory Research Program will identify and research social issues and trends in Omani society. By providing information on key issues and through the analysis of major social, cultural and economic issues policy recommendations will be made that will promote and improve social development and welfare.

Heading the Social Observatory Research Program’s Steering Committee is His Excellency, Under Secretary for Social Development. The Steering Committee is composed of:

- His Excellency, the Chair of Health & Social Committee in the Shura Council;
- representatives from ROP;
- the Ministry of Social Development;
- TRC;
- the Ministry of National Economy;
- the Ministry of Education;
- the Ministry of Health;
- Sultan Qaboos University.

The Steering Committee’s first meeting was held in February 2012. Among the items on the agenda were:

- the recruitment of a Program Director;
- identifying priority research areas for funding;
- the establishment of a comprehensive database for social indicators in Oman.
Awareness & Knowledge Transfer Programs
TRC strives to make the most of the output of Omani research by promoting the transfer of knowledge it generates to the wider community in order to contribute to economic growth and benefit society.

This is important because, in parallel with investment in research, an effective link between research and the market needs to be made so as to ensure good research becomes good business. Oman’s long-term competitiveness demands increased productivity, invention and innovation. Indeed, the exploitation of the sultanate’s research base plays a vital role in supporting the diversification of Oman’s economy.
Publication & Awareness Department

Significant efforts were made by the Publication and Awareness Department in 2011 to introduce TRC’s programs and activities to the public through print, radio, TV and the Internet.

TRC Youth Science, Research & Innovation Radio Show

This special 90 minute live radio show airs on Radio Sultanate of Oman. It reaches out to the youth of Oman to attract them to science, research and innovation. The 13 part series deals with a different topic in each program and features three guests from a range of backgrounds and fields.

Print

The Department has published a number of high-profile TRC articles, reports, interviews and statements in the domestic print media aimed at reaching a broad and diverse audience. As part of the efforts made in this regard, the Department also initiated a series of interviews with TRC-funded researchers whose work is part of TRC’s Open Research Program. The interviews were published on a weekly basis.

The Department also published interviews with HE Dr. Hilal Al Hinai, TRC Secretary General as well as with other key TRC Management personnel on a range of topics related to the Council’s work.
TV

The Department partnered with Oman Television to cover various TRC programs, events and activities. Indeed, a number of interviews were broadcast on TRC featuring Council management and funded researchers. TRC Interviews were also aired on the popular evening talk show Huna Oman.

Website

www.trc.gov.om is home to information about TRC’s research programs and the projects that have been implemented. The user-friendly website was launched in June 2011 and received substantial media acclaim.

Other Related Activities

TRC took part in ROP’s Road Safety Exhibition which showcased the important and valuable work being carried out by TRC’s Road Safety Research Program.
Conferences & Workshops Support Program

TRC funding of domestically organized scientific workshops, symposia and conferences continues to grow; indeed, there are a rising number of requests for this service. Thus, the Board agreed to increase the annual budget for this program from RO120,000 to RO160,000.

In 2011, the funding of RO160,000 for 28 activities, organized by various research and educational institutions, was approved.
TRC Organized Events

TRC has continued its efforts to raise awareness and build-capacity of local researchers and the public. In this regard, it hosted eleven lectures and seminars in 2011. They were presented by distinguished Omani and international guest-speakers. Highlights include:

- Addressing Global Challenges to Sustainable Development: The Importance of R&D and Innovation
- Synchronizing Fiscal and S&T Policies for Economic Diversification in Oil-based Economies
- Using Advertising to Reduce Road Trauma in Oman
- The Importance of Creating Links between Academic Institutions and International Markets through Innovation Value Chains
- Adapting to Sustainable Development: Short Term Steps
- Animal & Plant Genetic Resource Center Strategy
- Competitive Research Grant Writing & Research Grant Management (in association with CRDF (USA) and Nizwa University)
IT Support Programs
Information technology has a vital role to play in supporting research, innovation and entrepreneurship in Oman, as well as helping develop the national innovation ecosystem.

TRC uses IT to share information about Oman’s research landscape and its latest research achievements. It is used not only to inform researchers and scientists about research in Oman, but also addresses a host of other players from government, business, industry and the third sector.

By leveraging IT and through an impressive range of innovative eServices, TRC has improved access to information about research, simplified procedures for researchers and increased efficiency of administrative processes.
Grants Financial Management System
Fund Plus

Fund Plus is a modular framework which manages grant life-cycles. It does not replace, or do the work of, a financial system but addresses a variety of management issues such as record keeping, compliance, organizing, checking, communicating and interfaces with a financial system.

As a general rule, this life-cycle is managed and reported in two structures:

- Funding motivation
- Financial cost centers

From a funding perspective, reporting is structured according to donor funding and funding programs.

From a financial perspective, good practice and governance requires accounting by cost center and beneficiary.
The Electronic Submission System (TRESS)

To streamline the submission and follow-up of proposals to TRC an electronic submissions system (TRESS) has been designed. Following a trial phase in 2009 the system, which allows researchers to review the status of their proposal online, is now fully operational and received, in 2011, a total of 161 proposals in Open Research Grant applications.

The system is also used to maintain a database of researchers in Oman and includes knowledge identification which links TRC with other institutions and organisations.

Science & Technology Database

The Science and Technology Database records domestic scientific and technological progress. It includes details of research personnel and expenditure.

The Science and Technology Database is designed to:

- Support the national and institutional requirements of planning for science and technology
- Develop and submit the national science and technology report to authorized domestic and international organizations
- Monitor, track and record institutional and domestic progress and advancement in science and technology
- Benchmark domestic performance and progress in science and technology regionally and internationally

eLibrary

TRC has created a national virtual electronic library for academics and research institutions. This eLibrary is a consortium of Omani and international universities which provides Open Courseware (OCW) content and activities. This content consists of open free publications and formal course materials on the Internet.

TRC assessed the needs and requirements of the institutions with OCW to ensure the eLibrary carries the material that best suits the needs of national academic institutions.
Researchers Database

TRC has also created a unified database of researchers in the sultanate. The database details fields of expertise as well as research activities. The database has a variety of uses both domestically and internationally.

Research Equipment Database

Work has begun on a research equipment database which will enable researchers to locate equipment across the sultanate. One person from each institution will be designated as responsible for maintaining the accuracy of the information held on the database.

Referee Database

TRC has constructed a referee database which allows researchers to register themselves as international referees and have the opportunity to be called as referees in their field of expertise by TRC.
Figure 7: Referee Database: Numbers by Sector

- Humanities: 359
- Social Sciences: 288
- Medical & Health Sciences: 242
- Natural Sciences: 123
- Agricultural Sciences: 83
- Engineering & Technology: 4
The Oman Virtual Library for Science

In June 2011, the Oman Virtual Library for Science (OViLiS) Steering Committee was established to oversee the development of this initiative. Currently in its implementation phase, OViLiS will provide access to the latest research and information to a wide range of users through a nationwide library consortium.

Management
The OViLiS Steering Committee is composed of members from:

- TRC;
- SQU;
- the Higher Colleges of Technology;
- the Ministry of Higher Education;
- the Royal Hospital.

Plans for the development of OViLiS were drawn up by a three-team task force. These plans have now been submitted to the Board for approval.

A dedicated OViLiS team will be hired to run the project’s day-to-day management, supported by the three task force teams.

The Steering Committee will meet once or twice a year to evaluate OViLiS progress via a set of key performance indicators. The Committee will also assess plans for the project’s development.

Objectives
- Facilitate access to global scientific information for the target audience
- Build a solid information infrastructure for research activities
- Increase the quantity and quality of research output
- Increase the number of TRC e-service users
Project Drivers
OViLiS has been established to address the following issues:

• Access to peer reviewed publications;
• Effectiveness of a consortium for subscription costs;
• Enhancement of research collaboration domestically and internationally - bringing them in line with their international counterparts;
• Promotion of research activity/output in the sultanate by meeting the needs of researchers.

Target Audience
Initially, OViLiS will target researchers, academics, medical practitioners, postgraduate students, technicians and engineers at the 13 organizations currently linked to TRC’s Knowledge ID system. In the future, undergraduate students and nurses will also be targeted. For some products a national license may need to be acquired.

Contents
OViLiS will provide subscribers with access to content from recognized publishers. In the first 12 months, the aim is to subscribe to multidisciplinary content. During this period the needs of subscribers will be assessed so more specialized content can be provided in the second year; this practice will be on-going.

In the same period, the focus will be on subscription based journals after which OViLiS will include conference proceedings, citation databases, bibliographic indexes and e-books. OViLiS’s offer will not be limited to subscribed content; users will also be directed to peer-reviewed open access journals.

Access
Access to OViLiS content will be through www.trc.gov.om - this will facilitate the gathering of information regarding the products accessed. Moreover, this will also contribute to the number of visitors to the TRC website and help raise the visibility of services offered.
Looking Forward
The Science, Research & Innovation Park

Work continues apace on the Science, Research and Innovation Park with initial designs completed and approved. This is a major TRC project, with a total area of 280,000 m², the Park will be located in Al Khod, just 10 minutes drive from Muscat International Airport and neighbouring Sultan Qaboos University, Rusayl Industrial Estate, Knowledge Oasis Muscat and Oman Botanic Gardens. The Park will provide a vibrant research and innovation environment fostering business growth in the context of Oman’s innovation ecosystem.

The Park’s mission is to enhance the sultanate’s economic, entrepreneurial and technological wealth by supporting the growth of Oman-based innovative and research-driven companies in fields such as biotechnology, renewable energy and industrial technologies.

With the support of government organizations that include:

- Ministry of Higher Education;
- Ministry of Finance;
- Ministry of Commerce & Industry;
- Ministry of Oil & Gas;
- Ministry of Agriculture & Fisheries;
- Ministry of Regional Municipalities & Water Resources;
- Ministry of Environment & Climate Affairs;
- Chamber of Commerce & Industry.

The Park will offer a range of state-of-the-art hi-tech business accommodation and laboratory space, underpinned by a robust digital infrastructure and IT support services.

Tenants will have access to academic resources, seminars and a regular program of networking events. As a national focal point for collaboration between researchers, academia, industry and commerce, The Park will also provide introductions to funding, programs and people in order to help tenants grow and develop.

Moreover, the Park will actively promote and communicate its offer and image to ensure the success of its mission.
**Master Plan**

The master plan for the Park was drawn up by SQU specialists and developed in four stages starting with defining the Park’s operational parameters; the development of strategic alternatives; the formulation of draft master plan and a final master plan report.

The process of preparing the master plan involved a systematic process of consultation, report preparation and presentation, as well as an examination of several documents and reports prepared for TRC. Final design selection was made taking into consideration facility type and specialization. The facility to be developed and areas of specialization were identified as:

- Energy
- Health
- Food & Biotechnology
- Water & Environment

As part of the master plan study, a phasing approach for the implementation of the project has been recommended. The phasing stages have been organized to enable the gradual implementation of the Park taking into consideration the following:

- Ensure facilities are provided according to projected demand.
- Minimize logistic difficulties in the operation of phases by ensuring each phase can function as an integrated entity.
- Reflect the likely availability of development funding.
The four phases in the development of the Park are:

**Phase 1**
Construction of site infrastructure, the Innovation Centre Building and three large tenant lot developments.

**Phase 2**
Construction of Energy & Health Research Institutes, mosque, hotel and one large tenant lot development.

**Phase 3**
Construction of Water and Environment and Biotechnology Research institutes, the Park’s Administration and Client Services Building, recreation centre, school and two large tenant lots development.

**Phase 4**
Development of four large tenant lots.
Current Status
To date the following have been completed:

- Feasibility study February 2007;
- Comprehensive master plan study in collaboration with SQU, December 2009;
- Allocation of open space land with a total area of 280,000 m² close to SQU;
- Completion of the levelling contract awarded to Al Awazi International LLC, March 2011;
- Infrastructure contract awarded to Al Adrak Trading LCC, July 2011 - expected completion date March 2012;
- Tender document for the construction of Phase 1 (main building, social centre and workshops/labs) with detailed engineering drawings sent to tender board for announcement;
- Design and supervision contract awarded to National Engineering Office, August 2010;
- Marketing strategy completed by Euroconsultants, September 2011;
- TRC appointed Director of Science & Technology Park Department, September 2011.

It is envisaged that during 2012 the Park’s business plan will be developed addressing:

- Operating model
- Project requirements and benchmarks
- Marketing campaign
- Branding
Oman EcoHouse Project

Heritage
Oman’s architectural heritage dates back to the 13th and 14th centuries. Our architecture is an expression of our rich and vibrant culture and a source of great pride. These buildings have a legacy that goes beyond their imposing beauty; the eco-friendly construction methods used in them – including the use of compressed earth blocks, mud mortar and plaster; the water circulation systems; use of shade - are again of interest to the construction industry and, thanks to their low environmental impact and energy efficiency, are enjoying growing recognition and popularity around the world.

The Oman EcoHouse Design Competition taps into this rich legacy and the talents of the tech-savvy generation that is our youth; we look to the achievements of our past to inspire their creativity and imagination.

Through the competition we hope to develop the research and innovative thinking skills of Oman’s youth and foster awareness of sustainable social and economic development. Energy conservation and developing renewable energy, along with preserving the environment, are among the priorities of Oman’s eighth five-year development plan (2011 - 15).
**Background Information**

In Oman, most of the energy consumed is spent on air conditioning office buildings and houses. New energy technologies and architectural solutions are emerging which offer the opportunity to design and construct houses with vastly improved energy performance. Yet, fully exploiting this opportunity depends on the challenge of nurturing a ready and knowledgeable workforce of architectural and engineering practitioners.

To address this challenge, TRC initiated the EcoHouse competition for university students along with a design and construction company and a municipality representative to design environmentally friendly houses. The competition involves the design, construction and operation of houses designed by university competitors.

Through research and innovation in architecture, environment and renewable energy the competition raises awareness of the possibilities and importance of green building and eco-design.

TRC formed an EcoHouse Steering Committee comprising of officials from:

- TRC;
- Muscat Municipality;
- Ministry of Housing;
- Ministry of Heritage & Culture;
- Ministry of Environment & Climate Affairs;
- Ministry of Regional Municipalities & Water Resources.

Open to all higher education institutions, both public and private that offer academic programs in architecture, engineering, décor and design, the competition was launched 5 June 2011. Interested tertiary institutes were required to submit their initial registration by 29 June 2011 and continue to develop proposals and team formation until final submission on 3 September 2011.
Five proposals were reviewed by the Steering Committee – these were evaluated, revised, accepted and then progressed to the competition’s second stage of design and planning.

A TRC Energy Efficiency in Buildings workshop was organized 15 - 17 October 2011 to the five participating teams as well as officials from the public and private sector.

The workshop was delivered by experienced speakers from recognized green buildings organizations. One of the workshop’s objectives was to raise community awareness of the importance of energy efficiency in buildings and to familiarize Omani policy-makers and business community with the cost-benefits of implementing energy efficiency measures in buildings and the need to create a green building code.

At the close of 2011, the competition had reached mid-stage with the five teams working on their respective designs which will be submitted April 2012.
Objectives

- Promote a culture of research and innovation in high quality, cost-effective and cost-efficient eco-building design which contributes to sustainable social and economic development;
- Support creativity in higher education;
- Encourage the translation of ideas into useful products;
- Build national capacity, both individual and institutional (small and medium-sized enterprises), in areas of sustainable development such as: alternative energy; high quality and eco-friendly material production;
- Develop national policies to keep abreast of international trends;
- Foster partnership and co-operation between academia, business and government;
- Capitalize on Oman’s heritage in urban planning and architecture.
Figure 8: The EcoHouse Competition Process
Towards an effective national innovation system