جامعة السلطان قابوس
Sultan Qaboos University
رؤية عُمان 2040
نتقدم بثقة
Moving Forward with Confidence

# تواصل علمي
# TAWASUL

عمادة البحث العلمي
Deanship of Research

## Deputy Vice-Chancellor for Postgraduate Studies and Research:

## Over 700 consultant agreements inked with public and private bodies

عمادة البحث العلمي | DEANSHIP OF RESEARCH


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# Societal Impact of Research

When discussing research, the focus is often on its impact on society and practical applications of its results to promote people's welfare. The important of research is more evident when its findings benefit and contribute towards sustainable development and the national economy. It is notable that universities worldwide show much interest in research due to its outcomes for individuals, institutions, and society at large. They exert sustained effort to reap the intended benefits through encouraging researchers to deliver quality performance and cutting-edge research, thus refining their skills and keeping abreast of technological advances. Universities also ensure that local institutions are willing to fund scientific studies and apply their results to achieve progress and prosperity.

One should not overlook the important role that universities play in stimulating development, being the highest educational institutions in the country. The research output and development activities they deliver perform a crucial role in the national system of research and development to achieve aspired progress. In the Sultanate of Oman, Sultan Qaboos University has the largest number of researchers and most diverse, advanced research facilities and capabilities. Therefore, the development of research activities at the University will contribute to the development of local human capacity to address problems in the Sultanate and the wider region.

In this context, societal partnership is of paramount importance to support research and development and steer research activities for the benefit of economic development plans. On the other hand, one cannot overstate the value of media policy in highlighting the role of research in community development, promoting unconventional sources to fund societal partnerships, and informing the strategies of research institutions to encourage partnership with public and private sectors.

In this issue of Tawasul, we shed light on the role of public and private sectors in supporting research and its impact on society by reviewing the sources of funding for research in various fields. This publication also includes an interview with Dr. Amer Al-Hinai, Deputy Vice-Chancellor for Postgraduate Studies and Research, who reflects on the University's research efforts within Oman Vision 2040 and in collaboration with government, private bodies, and the community at large.

# SQU Marks Annual Day

SQU celebrated its 22nd Annual Day on Monday, the day that marks the visit of the late Sultan Qaboos Bin Said to the University on May 2, 2000. A ceremony was held under the auspices of H.E. Dr. Mahad Bin Said Ba'owain, Minister of Labour, during which H.H. Sayyid Dr. Fahad Bin Al Julanda Al Said, the Vice-Chancellor, delivered a speech. Dr. Amer Al-Hinai, Deputy Vice-Chancellor for Postgraduate Studies and Research, announced the winning research projects for the 2022 Royal Grant, which provides funding to long-term strategic research projects of an interdisciplinary and knowledge-based nature. Researchers, academics, and distinguished employees and students were also honored.

The event witnessed screening of the University Day film, Future Pinnacles, featuring SQU's major scientific efforts that addressed the Sultanate's challenges in various fields, and which have resulted in diverse moral, psychological, and socioeconomic contributions to society, touching upon issues related to family, health, security, safety, and stability of society.

The film, produced by the Deanship of Research – Department of Academic Publication and Outreach, showcases the University's endeavors to strengthen collaboration with community organizations and increase the benefit from research efforts. The film follows a narrative style while maintaining quality of content.

The celebrations included a scientific fair to highlight the University's role in implementing research output in both public and private sectors in Oman. It included several corners: The main corner covered a scientific library of books and magazines, studio for television and press interviews, cinema screen for research films, and statistics on graduate studies. Other corners were designated for research projects, statistics, and achievements, the PURE platform, and an interactive screen for social networking sites of the Deanship of Research.

**Future Pinnacles: A Tagline for University Day Film & Fair**

**Deputy Vice-Chancellor for Postgraduate Studies and Research:**

# Over 700 consultant agreements inked with public and private bodies

**There is no doubt that public and private sectors play a key role in the advancement of research. This is evident through building partnerships with research institutions and steering research and consultancy services to meet the needs of socio-economic development plans. In doing so, we boost growth, knowledge, and creativity. Such collaborations are crucial in this regard, but the issue is how to expand them in terms of quality and quantity and how to shift research from being a closed, regional activity into an open, international one.**

**In this interview, Dr. Amer Al-Hinai, Deputy Vice-Chancellor for Postgraduate Studies and Research (DVC-PSR), talks about the research practices at SQU, aspirations of Oman Vision 2040, and significance of partnerships between the University and public and private sectors in the areas of research and development.**

**How would you characterise the University's role in achieving the aspirations of Oman Vision 2040 in research and innovation?**

SQU has always been committed to fulfilling its pivotal role in serving the socio-economic and intellectual development programs in the country. Our efforts are now focused on achieving the strategic aspirations of Oman Vision 2040. To this end, certain measures have been endorsed within the strategic areas that form the foundations of the Vision, including the areas of research and innovation. Generally speaking, the University's second executive plan (2021-2025), together with its themes, has been reviewed to ensure alignment and consistency with the Vision's requirements and objectives. Accordingly, the efforts are now concentrated on seeking means of implementing several strategic projects totally in line with the priorities of the Vision. This is based on a clear approach and a well-defined, detailed action plan to ensure optimal attainment of the goals.

**What are the key steps made by the University in this regard?**

The University administration and employees work hard to harness all capabilities to achieve the desired goals. This is possible thanks to the stimulating environment we have fostered for research and innovation, considerable scientific expertise, previous achievements, and the attention H.M. Sultan Haitham bin Tariq has given to research, creativity, and innovation.

Perhaps the most integral step was to review the rules and regulations that regulate research and innovation at the University to ensure they are effective and respond appropriately to current trends. We have also focused on finding ways to expand scientific publication and research output of our researchers in global databases, and establish a stimulating research culture through reconsidering academics' work load in research to motivate them to produce solid scientific studies.

**Some researchers think there is a lack of incentives and awards for creative and innovative work. What do you think of this?**

SQU has introduced new awards for stimulating researchers such as the Best Researcher Award for non-academic researchers and Young Researcher Award for non-PhD researchers. The winners will be announced at the University Day starting this year.

**Renewed focus on translating research outcomes into products and services**

Other prizes include the SQU Publication and Patents Award allocated to the University's distinguished researchers and academics who have published in leading journals, sought patents, and generated and disseminated innovative knowledge. The Best Research Group is another award that aims to highlight the role of research groups at the University and encourage researchers to engage in specialised research teams that allow them to share knowledge and experience. In a move to urge researchers to develop their scientific output, a sabbatical was introduced after it was initially confined to faculty members only. Furthermore, measures have been taken to document the University's research output and scientific activities by subscribing to the comprehensive global database, the SQU Pure Experts Portal, which will promote the University's reputation globally.

All these measures will greatly improve the University's standing in the QS World University Rankings Index, which is one of

the performance indicators for the priority of teaching, learning, research, and national capabilities on which the Oman Vision 2040 is based.

**Some public institutions seek service from regional and global think tanks. In your opinion, can SQU's research and human resources play this role?**

Since its inception, the University has been considered by its founder, the late Sultan Qaboos Bin Said, as a national think tank for building national capacities and serving various sectors. So, the University has spared no effort to deliver consultancies to those seeking its services. Since 1995, many public and private organisations have benefited from our expertise and facilities through applied research consultancies aimed at addressing various challenges or through a systematic development of knowledge, in addition to finding new opportunities or making new discoveries that support those institutions. Between 1995 and 2021, there were 705 consultant agreements, and, in 2021, the University's colleges and research centres provided 33 research consultancy services. SQU is keen to benefit various sectors, given the role of consultancies in gaining more experience, consolidating scientific potential and alignment of academic programs and research projects with practical and urgent issues, and building effective research partnerships.

**New awards established for best and young researchers**

**Are there any research or innovation projects that will come to light soon?**

The University's main strategic projects on research and innovation are based on its 2040 strategy and listed in the first document of its executive plan (2021-2025). They consist of projects strengthening applied, interdisciplinary, and multidisciplinary research, which then energise research capacity and consolidate SQU's research culture, as well as directing researchers toward expanding applied studies that meet socio-economic needs in a way that achieves maximum benefits from the research output and applications. An efficient academic innovation system is another project that can transform knowledge into value benefitting socio-economic development. Finally, there is a project on the gradual transition toward a university entrepreneurship model, which seeks to enhance entrepreneurial skills in teaching, research, and administrative activities as well as increasing cutting-edge scientific and research output.

**What is the nature of research partnerships between SQU and other institutions?**

The University is keen to build and expand effective research partnerships with other institutions inside the Sultanate of Oman and beyond, given the importance of such agencies, the University, and society. We have research collaboration agreements and programs with the public and private sectors and we serve on several committees, including the steering committees on drafting a research and innovation law as well as that of EJAAD. In my capacity as DVC-PSR, I serve on several joint committees with other organisations and on the advisory committees of Research Centres that include representatives from other institutions. The mechanism for selecting topics for strategic research projects, funded by H.M. Grant, demonstrates another form of effective partnership with other stakeholders who are involved in defining the country's urgent strategic issues that need to be investigated. So, the topics are circulated to researchers at the University, then a member from the institution, concerned with the research area, joins a research project team.

**What are the mechanisms for collaboration between SQU and such organisations?**

The University is taking considerable steps to consolidate partnerships with other sectors in the near future. One measure that has been taken is to set a framework for enhancing cooperation between various stakeholders, concerned with the joint strategic research projects, as part of the procedures to implement the project for strengthening applied, interdisciplinary, and multidisciplinary research. Through the project of the gradual transition towards a university entrepreneurship model, the University aims to increase the public and private sectors' support for student start-ups as part of research outcomes to develop an entrepreneurship culture. This effort will also introduce the larger society to the concept of entrepreneurship, in addition to other goals set in the framework. In this regard, the relevant policies and procedures are regularly reviewed.

**Can you name key funding programs offered to the University to address community issues?**

The University has a number of Research Chairs that clearly embody effective research partnership with other local, regional, and international organisations. Their main goal is to provide such agencies with scientific studies and practical expertise based on solid scientific foundations in exchange for funding.

There are agreements between the University and the private sector to establish strong partnerships to address national issues. Some examples include the Omantel Grant for Research Projects in the Internet of Things, Artificial Intelligence and Nanotechnology, Oman LNG-Funded Research Program for Empowering People with Disabilities, and BP to support sustainable energy research. A number of institutions also keep coming back to us for solutions to problems they encounter.

On the other hand, the University has employed the principle of effective strategic partnership at the level of postgraduate studies, since they are closely related to research activities and the goal of building a national specialised research capacity. Private-sector companies such as Petroleum Development Oman (PDO), CGG Services

## Approved Graduation Projects Support Program

(Oman), and Oman Oil Marketing Company offer scholarships to postgraduate students at SQU. Funding is also provided by the University in certain categories such as in terms of grants to employees of the Ministry of Education and Ministry of Endowments and Religious Affairs.

**Some countries turn research into an industry and source of national income. Have we taken steps in this direction, and what are the possible challenges, if any?**

No doubt, the University realises the pivotal role of research and innovation in achieving economic growth, building a knowledge economy, and thus gaining a global competitive advantage. There have been several initiatives and activities made by the University to provide the infrastructure and systems necessary to translate research outcomes into prototypes, products, services, value-added processes, and start-ups that can contribute to the national economy. Attention has also been paid to intellectual property (IP) and how to support, protect, generate, and utilise it at the national, regional, and international levels.

In this respect, the University has been keen to promote the role of the Innovation & Technology Transfer Centre in taking systematic steps that adhere to international practices. The Centre is concerned with evaluating the University's research output and ensuring investment in innovative research findings to convert them into products, services, and patents. It also provides support and guidance for innovators.

As mentioned earlier, one of the University's strategic projects has to do with developing an innovative system, which is relevant here. The project involves implementing practical procedures to set in motion an overall framework for converting ideas into innovative products, assessing the University's IP and patent policy, and reviewing regulations for research, postgraduate studies, academic promotions, and employment in order to motivate researchers and academics to innovate.

Recently, the Graduation Projects Support Program was approved. It supports the process of transforming undergraduate students' research results into added value, and thus starting up businesses dedicated to solving societal issues. Establishing this program is an important step toward supporting the University's efforts to realise its aspirations and strategic plans for research and innovation within Oman Vision 2040.

# AI Applications in Education

**Dr. Zia Nadir from the College of Engineering has conducted an Omantel-funded research project on using Artificial Intelligence (AI) in education at SQU.**

## Academic significance

The importance of the project is in showing how AI technologies can help education systems to use data to improve education quality at SQU. AI can develop software or hardware techniques to simulate human intelligence.

## Objectives

- A comprehensive study to determine the type of AI tools to be used in the SQU education system and how such tools can be applied and at which specializations and levels.
- A road map for building an AI-based education system to be designed and the implementation stages to be defined.
- Challenges and difficulties when applying AI in the SQU education system to be identified.

## Methodology

- Interviews were carried out with SQU's experts, about the AI-based education system.
- Experiences of international universities regarding AI in education were studied.

## Results

- A Chatbot was developed for accessing info through SQU and Deanship of Admission and Registration.
- FAQ/Authentication-OTP mechanism/Feedback sections were added.
- AI simulation of the academic advising system was carried out.
- Teaching was enhanced by facilitating the teacher's work in lectures and student assessment.
- Learning development was enabled based on the student's academic level.
- Assistance was provided to students in obtaining answers to common questions in scientific lectures.
- A mobile phone app was designed for using AI technologies in teaching and learning at SQU.

## Recommendations

- Adopting the developed designs to advance teaching, learning, and academic advising at SQU.
- Disseminating the existing applications to promote education at schools in the Sultanate, in coordination with the Ministry of Education.

# Community Partnership Between SQU and Private Sector Building a Productive Knowledge Economy

Sultan Qaboos University (SQU) has always been keen to prioritize research to ensure potential investment to generate economic and financial revenues for its academic, scientific, and research activities. Therefore, strengthening scientific collaboration with the private sector in research and gearing the partnership to prioritize development plans in the Sultanate of Oman was necessary. Further, the University had to ensure that all research projects involve applied aspects and can utilize the resources in place such as laboratories, research centers, human capacity, and distinguished researchers, as well as the private sector's financial resources, marketing expertise, and the training and practical opportunities it provides for students.

In pursuing this approach, the University has been acting in consonance with the directions of Oman Vision 2040, which stresses on applying the concepts of a knowledge economy, encouraging partnership between public and private sectors, and transforming scientific innovations into economic products.

The relationship between the University and the private sector contributes to providing researchers with topics based on the current practical reality. It strengthens the University's position in terms of staying competitive, keeping abreast of modern advances in various fields, and sensibly using its scientific, human, and material resources in solving the problems in both sectors, rather than staying confined to theoretical matters. Additionally, such a fruitful collaboration can develop the national capacity of universities and private-sector institutions through knowledge exchange, translate universities' expertise into reality by creating new products and methods, or develop existing ones for the private sector.

SQU has forged cooperation partnerships with private-sector institutions, aimed at addressing national issues. One outcome of such collaborations is the Omantel grant promoting research and development in the field of information technology (IT), telecommunications, and nanotechnology. This funding achieves the sustainable development goals of stimulating innovation and advancing sustainable industries that serve all interests. The grant (Omantel for Research Projects) came into effect with the signing of an agreement between SQU and Omantel in 2017, and, since then, 22 projects have received funding.

The Oman Liquefied Natural Gas (Oman LNG) Development Corporation also funds the research program to empower people with disabilities. It has approved nine research projects supporting research and innovations in software and computer applications, programs, and curricula for people with disabilities, and studying and drafting laws and regulations to guarantee the rights of people with disabilities. This collaboration also supports research into the diseases prevalent in this group, thus facilitating their living conditions, in addition to other studies addressing different topics.

A research cooperation agreement with BP has been reached to support research promoting sustainable energy production at a low cost.

# Oman LNG–Funded Research Program for Empowering People with Disabilities

## Computer software and technology applications

- Efficacy of an E-application in Developing Language, Social, and Creative Thinking Skills for Gifted People with Autistic Spectrum Disorder (Gifted Autistic) in the Sultanate of Oman, by **Dr. Ali Mahdi Kazim.**
- Effects of Virtual Reality Training on Upper Limb Motor Recovery of Stroke Patients, by **Dr. Mun Chan.**

## Occupational environment

- Impact of Disabled Employees on Profitability and Productivity of Companies in the Sultanate of Oman, by **Dr. Walid Al-Mansi.**
- The Role of Professional Empowerment Programs in Improving Life Quality for People with Mental Disabilities, by **Dr. Hammoud Al-Nawfali.**
- Assessment of Entrepreneurship Skills of People with Disabilities, by **Dr. Ashraf Musharraf.**

## Educational services and training programs

- Impact of a Kinetic Learning Bag on Improving Physical Abilities and Level of Sensory-Motor Perception of Children with Intellectually Disability, by **Dr. Badriya Al-Hadabi.**
- Efficacy of a Morphological Awareness-Based Program in Improving Oral Reading and Reading Comprehension among 4th-Grade Students with Reading Difficulties in the Sultanate of Oman, by **Dr. Fatima Al-Kaf.**
- Learning Outcomes of Students with Disabilities and Individual and Institutional Impacting Factors in Omani Schools: Towards Building Inclusive Institutional Efficacy in Light of Ideal Global Models, by **Dr. Yasser Al-Mahdi.**
- The Reality of Services Provided to Students with Disabilities in Higher Education Institutions in the Sultanate of Oman, by **Dr. Amjad Al-Haj.**

## Results

Humanities research projects support people with disabilities by creating training curricula, providing devices and tools to facilitate their life conditions, and investigating the occupational environment suitable for them in terms of physical and human aspects. They also seek to identify indicators helping students with disabilities pursue higher education, paving the way for a wider scope of learning, which will streamline their integration into schools and life.

# Omantel Grant for Research Projects in IT, Telecommunications, and Nanotechnology

## IT and Telecommunications

- Designing and Developing a Peer-to-Peer Energy Trading System, by **Dr. Rashid Al-Abri.**
- Transfer of Live Virtual Machine to Support Real-Time Internet of Things Applications in a Heterogeneous Foggy Environment, by **Dr. Nasser Al-Zaidi.**
- Designing Microwave Sensors for Palm Weevil Detection in the Sultanate of Oman and Methods for Quality Assessment, by **Dr. Muhammad Beit Swailem.**

## Nanotechnology

- Renewable Energy Stimulated Multi-Channel Flow System for Decomposition of Harmful Pigment Particles Using Metal Oxide Nano-decorated Nano-Assemblies, by **Dr. Myo Tai Zar Mint.**
- Engineering New Nanomaterials to Convert Carbon Dioxide into Usable Chemicals, by **Dr. Rashid Al-Hajri.**

## Results

The research projects are expected to produce positive results that contribute to translating research efforts into practical solutions to the problems and challenges facing Omani society and beyond. Such solutions address carbon dioxide emissions and techniques to convert them through nanotechnology into industrial, food, and medical materials that can be used, in addition to finding a low-cost and environmentally friendly mechanism for oil extraction and treating waste or polluted water locally and globally.

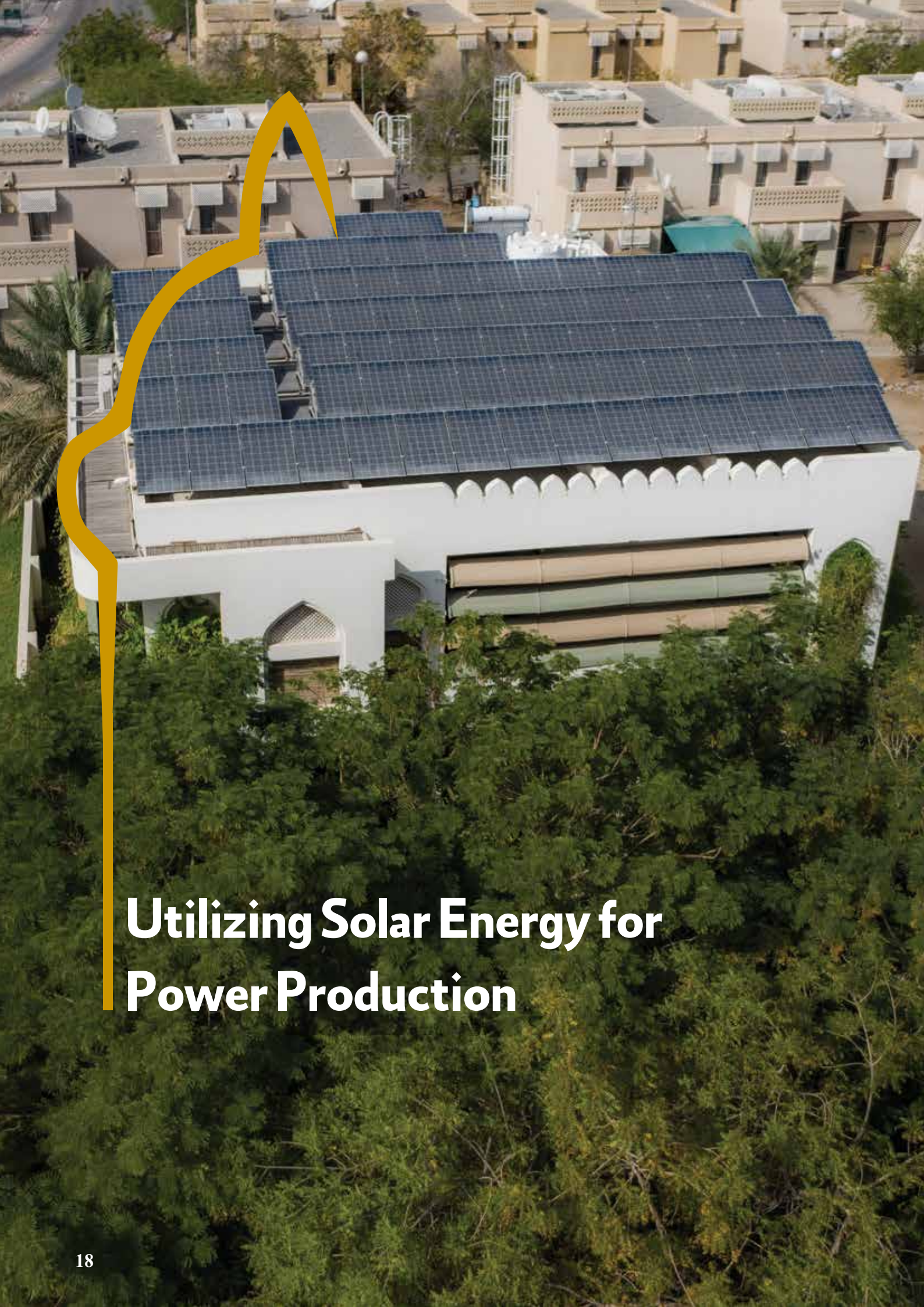
As for telecommunications and IT, these projects address different issues: One looks into security threats facing a cloud-computing environment such as network collapse, security, and response time and the means to replace it with cloud computing to provide HD services. Another concerns designing a smart system that works with advanced algorithmic methods to press the cost of energy trading, while a third one suggests a three-dimensional geometric model with a high capacity to detect palm weevils.

# Research Collaboration with BP to Support Sustainable Energy Research

- Management of Renewable Energy Resources in Preparation for Launching Smart Electricity Grids in the Sultanate of Oman, by **Dr. Nasir Zadeh.**
- Evaluation of Offshore Wind Energy Resources in the Sultanate of Oman, by **Dr. Yassin Al-Sharabi**
- Harvesting Solar Energy Using Organic and Organometallic Polymers, by **Dr. Mohamed Salah El-Din.**
- Utilizing Solar Energy in Generating Power Using a Parabolic Trough with Organic Rankine Cycle, by **Dr. Nasser Al-Azri.**
- Using Carbon Dioxide in Harvesting Geothermal Energies in Underground Low Levels in the Sultanate of Oman, by **Dr. Ming Jeh Chen.**

## Results

These projects will contribute to the growth of renewable energy by exploiting waste heat and converting it into electricity, evaluating their economic feasibility in light of high energy prices and by launching smart electricity networks in the Sultanate of Oman.



# Utilizing Solar Energy for Power Production

**Dr. Nasser Al-Azri of the College of Engineering has carried out a BP-funded research project aimed at investigating the utilization of solar energy in generating power using an organic Rankine cycle.**

Dr. Nasser Al-Azri
College of Engineering

## Objectives

- Investigate the heat harvested from solar energy using parabolic trough throughout the year in Oman.
- Evaluate the economic feasibility of using this technology in light of the rising energy prices locally and globally.

## Research methodology

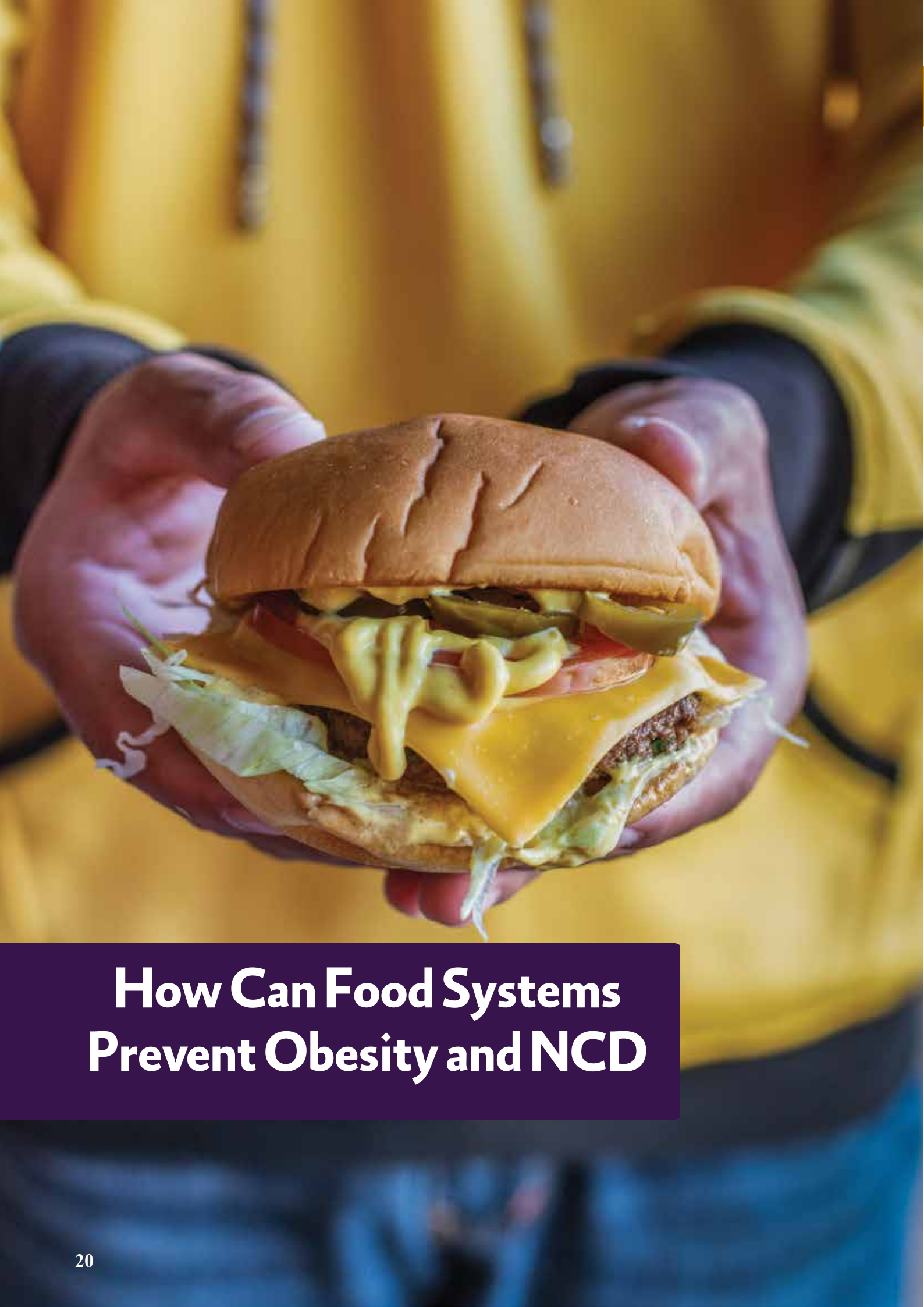
- An extensive study of solar radiation in some regions of the Sultanate was conducted by referring to archives of weather readings and satellite databases for at least the last ten years.
- The use of ideal climate year formation algorithms, which consist of ideal weather readings that can be relied on in modelling the weather in certain locations.
- The use of a parabolic trough type solar thermal collector, which is directed towards the sun using a dynamic tracking device to ensure the maximum amount of energy is gained.

## Findings

- There is a significant lack of weather and solar radiation readings, which led to the re-collection and analysis of weather and solar radiation data from different sources.
- Solar energy was increased when using the sun tracking technology, but it is possible to obtain almost maximum energy with a limited direction of solar collectors.
- The existence of suitable conditions for the use of Rankine cycle is mainly determined by the existing inexpensive thermal energy, which can be used to exploit waste heat from industries with high heat use.

## Recommendations

- Documenting and archiving weather and solar radiation readings to enable their use for research and design purposes in renewable energy.
- Examining possible alternatives for exploiting wasted thermal energy, such as energy generated by industries that use thermal processes.
- Providing expert technical support and upgrading systems to cope with technologies locally.



# How Can Food Systems Prevent Obesity and NCD

Dr. Mohammed Al-Khusaibi
College of Agricultural & Marine Sciences

Malnutrition, unhealthy diets, and non-communicable diseases (NCDs) are closely linked. Food systems define the food environment, which consists of the physical, economic, political, and socio-cultural conditions that shape people's dietary choices and nutritional status.

Transforming food systems globally and nationally is fundamental in trying to address all forms of malnutrition and diet-related NCDs. Food systems include the food supply chain, food environment, consumer behavior, and environmental empowerment.

## Study significance

There is an urgent need to consider a comprehensive approach that takes into account behavioral and environmental risk factors along with existing diseases, management protocols, and other interventions for NCDs' management, due to the excessive deaths from cardiovascular and respiratory diseases, cancer, and diabetes (the so-called NCDs), which constitute 71% of all deaths in the world.

## Objectives

This ongoing study is building on the current data, collected in collaboration with the Office of the UN's Food and Agriculture Organization (FAO) in the Sultanate of Oman, the funder of the study. A data analysis was conducted to provide decision makers with a systematic review of the evidence and to suggest actions aimed at reducing the levels of overweight, obesity, and NCDs.

The study is expected to draw conclusions on the following:

1. Mapping out the current situation in the Sultanate as follows:

Analyzing the supply chain for agricultural production and trends in the Sultanate, and identifying information and knowledge gaps in relation to the supply chain.

Analyzing the general consumption trends of meat and poultry in Oman, consumer profiles, frequency of consumption, and impact of subsidized foods on purchasing power and consumption.

Food choice behaviors and how they may contribute to the incidence of NCDs and obesity among Omanis. This includes studying the knowledge, attitudes, and behaviors of Omanis, and their impact on the food system in the country.

Analyzing the current situation of malnutrition and drivers of change, and considering current national interventions, as well as uncovering and discussing statistics.

2. Analyzing the food system in the Sultanate and assessing stakeholders (public and private sector and civil society organizations relevant to the food system), in order to support future policy planning toward developing a sustainable food system.

3. Formulating policies on diets and food system that cover education, health, media, agriculture, industry, and taxes.

# Marketing of Research Boosts Knowledge Economy

Dr. Hashil Al-Saadi
Centre for Preparatory Studies

Numerous countries are now adopting a knowledge-based model of the economy where human capital, intellect and research are deemed essential. However, research can only be useful and impactful when it reaches the public. As such, effective dissemination and marketing of research results is a challenge many universities and research institutions face nowadays. How then can research output be best communicated, disseminated and marketed?

To begin with, scholars agree that having a well-defined, forward-looking and flexible vision for research and research dissemination is a crucial starting point. Such a vision should specify what is being researched, how and with what results. The vision should also determine how research results are to be disseminated and marketed.

Research can also be marketed through institutional and individual collaboration and networking. Universities and individuals should join efforts and work collaboratively to establish real and effective partnerships among themselves, whereby innovative faculty members and research students can effectively network, conduct multi-disciplinary research and benefit from the research capacities in place. Research exchange programs could also be a potential outcome of such partnerships. This would create numerous opportunities for researchers to collaborate and promote their research ideas.

Effective partnership with the industry is also another important strategy that universities and research institutions should adopt to effectively market their research efforts and output. The industry provides research with ideas while, in return, research offers solutions to the industry.

Last but not least, the role of new technologies cannot be overlooked. An increasing amount of research is now being conducted, shared and marketed via social media accounts and platforms including Research Gate, Linkedin and YouTube as world-renowned platforms, and SQU Pure and Shuaa as local hosts of research profiles and repositories.

# A Learning Bag for Disabled Children

Dr. Badriya Al-Hadabi
College of Education

**Physical and motor activities are important for the development of children, and particularly the disabled. They help enhance the children's mental, cognitive, social, and emotional skills. Motion is the activity and basic form of life through which self-realization and the acquisition of knowledge are attained at all levels. In this regard, Dr. Badriya Al-Hadabi from the College of Education is designing a kinetic learning bag to improve the physical abilities and level of sensory-motor perception of children with intellectual disability. This is part of a study funded by Oman LNG.**

## Goals

The research aims to develop a kinetic learning bag to be used in a training program for children with intellectual disability and to see how it impacts their physical abilities and sensory-motor perception.

## Initial results

**The study included the following physical tests:**

- (Free) Counter-movement jump
- Board jump – three-hop
- Static balance
- Speed (5–10 meters)
- Endurance (6-minute walking)
- Flexibility

**The sensory-motor perception tests are as follows:**

- Testing the reflex speed of the lower extremities to an auditory stimulus
- Testing the reflex speed of the lower extremities to a visual stimulus
- A 10-meter distance perception
- Perception of time (5 - 10 - 15 seconds)
- Direction Awareness (30 cm)
- Purchasing a kinetic balance device
- Defining the features and size of the research sample

## Recommendations

- Designing the educational bag content.
- Implementing the body measurements, physical tests, and sensory-motor perception adopted by the experts in the study.
- Developing the physical and sensory-motor abilities of the intellectually disabled through the kinetic educational bag.
- Helping the intellectually disabled in overcoming their motor, physical, and psychological problems and facilitating their integration into society.

# Public and Private Sector Partnership Fosters Innovation at SQU

**Empowering women in innovation and entrepreneurship**

**Funding agency:**
**World Intellectual Property Organization (WIPO)**

It seeks to enhance the innovative capabilities of women participating in the national innovation system by running training courses to spread knowledge and cultural awareness for Omani women and support their effective use of the intellectual property system to protect and market their inventions.

**A letter of collaboration between SQU and Food Innovation Complex**

**Funding agency:**
**Food Innovation Complex LLC**

It aims to develop research and innovation in the field of food and biotechnology through developing safe and healthy food products that meet the market needs and using them to promote local added value.

**Scientific Incubator Program**

**Funding agency:**
**Ministry of Higher Education, Research, and Innovation (Manafa'a Program)**

It supports scientific innovations and research projects in their early stages to reach a level of production and industrialization and guides Omani youth into entrepreneurship to provide local added value to the national economy. The program is a window to take advantage of opportunities for business partnerships with specialized companies that extend beyond studying market needs and expanding production for the local market.

**Licensing the use of modified cells for Dr. Sirin Adham Yaeesh**

**Funding agency:**
**Applied Biological Materials, Inc.**

The Innovation and Technology Transfer Center (ITTC) negotiated with Applied Biological Materials Inc on licensing the use of modified cells for researcher Dr. Sirin Adham Yaeesh—College of Science, Department of Biology—which will have a positive impact on encouraging other SQU innovators to seek protection and marketing of their innovations through the Center.

**Collaboration Agreement between Omantel and SQU**

**Funding agency:**
**Omantel**

It aims to enhance ITTC's activities and approved programs in the field of intellectual property, provide more areas for the Center's work, and create a stimulating and supportive environment for Omani youth. Additionally, it seeks to build research capacity by setting up science and technology-based student start-ups.

# SQU Offers 1500 Licenses to Access "Pure"

In an effort to increase the global engagement of its researchers, the University has provided 1500 licenses to access Pure, a database that sustains international networking and collaboration between SQU and other research institutions around the world. This digital platform manages research data and activities for any academic or research organization and can be considered a basic source of reference for researchers. External institutions can access the University's research expertise.

The platform offers several benefits:

- It provides a single source for research data (number of researchers, research activities, publications, awards, doctoral supervision, etc.).
- Researchers will not have to fill out forms about their research qualifications.
- It furnishes accurate data on studies and research activities.
- The platform provides a soft copy of researchers' CVs and highlights the quality of their research.
- It stores researchers' output in both Arabic and English.
- It exhibits scientific collaborations between the University and other local and international bodies.
- The University can list all its research devices.

| Profiles | Research units | Research output | Activities | Prizes |
|---|---|---|---|---|
| 996 | 153 | 23816 | 39 | 64 |

# Boosting Research Marketing

Maitha Jumaa Al-Siyabi
College of Education

Researcher Maitha Al-Siyabi, a postgraduate student at the College of Education, has been awarded a master's degree for her study on the reality of marketing of research at SQU in light of Oman Vision 2040.

## Objectives

The study investigated the reality of research marketing at SQU within Oman Vision 2040.

## Results:

The SQU Strategic Plan (2016–2040) supports the aspirations of Oman Vision 2040 towards the commercialization of research through applying modern marketing methods based on advanced technology.

The University seeks to enhance collaboration with the beneficiaries to develop research marketing, by following a number of procedures, including joint research, consultancies, and research chairs, as well as delivering training courses for the community.

The University makes considerable efforts to utilize local, regional, and international cooperation in marketing research output.

The study participants' views suggest there are inadequate training opportunities and incentives for research marketing.

## Recommendations:

There is a need to find a coordinating body that could bring together various efforts toward marketing research findings.

Effective mechanisms should be in place to support research marketing links between the University and the private sector.

Incentives should be provided for creative and innovative research efforts to promote their marketing chances.

We need to adopt appropriate approaches in managing human resources, through recruiting distinguished researchers and employees and providing training on modern marketing techniques.

Marketing media policies should be strengthened at SQU through various social media networks.

# Science Media and Society

Dr. Faten Bin Lagha
College of Arts and Social Sciences

Building an infrastructure of a knowledge society is one of the pillars of development in the Sultanate and the themes of Oman Vision 2040. The Vision includes different aspects, most notably the enhancement of a knowledge society, focusing mainly on developing national capabilities through creating a national framework for promoting knowledge awareness of individuals. The first priority of Oman Vision 2040 includes a number of goals, including building a society that is capable of assessing, critiquing, exploiting, producing, and disseminating knowledge, as well as developing a knowledge-based society that is conscious and mindful of its identity, which possesses skills and capabilities and keeps abreast of the knowledge developments and technological changes.

Since the media play a major role in spreading knowledge, several Arab and global voices have raised the issue of how to harness media for science promotion. They have called for the media to pursue a clear-cut policy to engage academia, research centers, local communities, and the private sector in developing and disseminating knowledge, thus expanding university outreach to community and consolidating the values and concepts of community engagement.

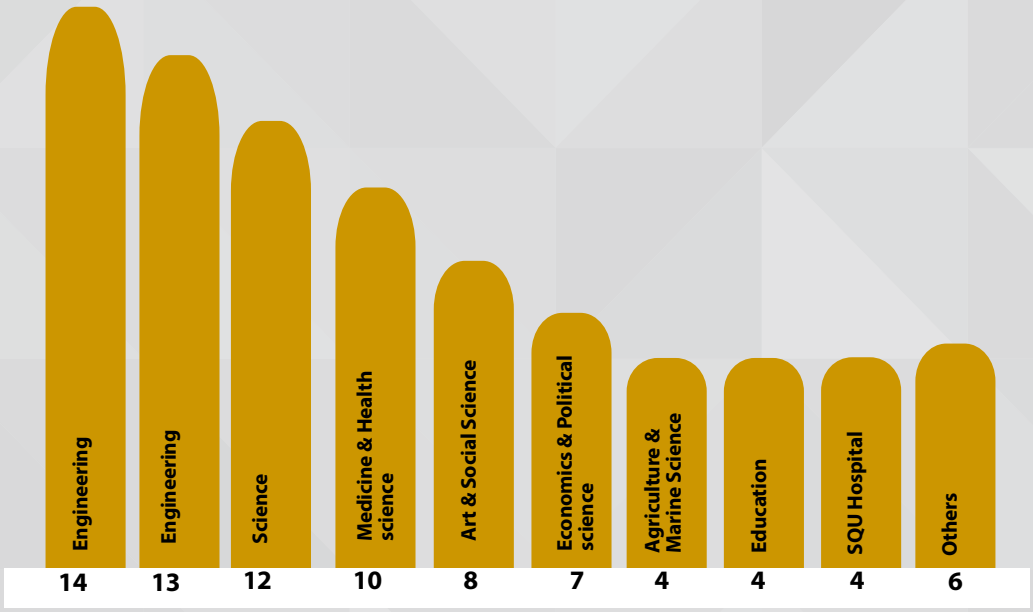
There is no doubt that investing in knowledge requires media outlets to be transformed into incubators for disseminating scientific findings, promoting engineering and technological laboratories, and supporting innovations, thereby ensuring the sustainability of knowledge in society. The overlapping of media functions with those of community agencies in general, and educational ones in particular, can impact the intellectual and social structure of societies directly or cumulatively over time. Therefore, media experts underline the role of media in educating individuals through spreading and interpreting research findings so as to employ scientific achievements in enhancing societies.

The dissemination of knowledge is one of the important requirements for creating successful media that can assume a role in promoting development and knowledge, especially in light of complex media contents and new technological innovations. At present, Arab media are facing significant challenges that require a particular agenda to link media content to scientific advances delivered by universities. This way, the media can keep themselves updated with the national plans to support research, keeping in mind that such a role can only be effective when media professionals have acquired the know-how to deal with scientific content.

# SQU Faculty Engage in 82 Conference Activities in 2021

Conference attendance is an important outreach outlet that benefits researchers with respect to research quality assurance and intellectual property protection, while enriching scientific studies in general.

In 2021, SQU academics from different colleges, centres, and units took part in 82 conference activities. The College of Nursing presented the highest number of works with 14 papers, followed by the College of Engineering with 13 papers. It is worth noting that conference attendance dropped due to the Coronavirus pandemic and lockdowns in many countries.




**Grand Total**

**82**

# Research on Advertising Strategies

Dr. Muhammad Satour of the College of Arts & Social Sciences has investigated the role of advertising strategies in designing ad messages. The research aimed to shed light on the important elements of successful ad message delivery and persuasive strategies that appeal to the audience. The findings will contribute to advancing the advertising industry in Arab countries.

The study concluded that persuasive communication in advertising could produce the intended effect on the target audiences, and meet their needs. Ad strategies can impart the power of convincing, being driving forces for instincts (feelings) that lie between logic and emotions, in order to stimulate the purchase of products and services. They are diverse and flexible and can be used to address various audiences and thus achieve the intended purpose.
The study underlined the importance of collaboration between the government companies and advertising businesses in order to set up a creative and successful strategy for promoting their products and services. It suggested that specialized colleges offer a course on advertising strategies.

# Commercial and Nutritional Benefits from Date Pits

A research team led by Prof. Muhammad Shafiur Rahman has found that date pits, the waste from the date fruit processing factories, can be recycled to produce fibers, which can minimize environmental waste and promote food security.

In their study, the team conducted different chemical treatments to isolate the cellulose fibers from date pits. They measured thermal, molecular, and structural properties according to their composition, size, crystallization, and functional groupings.

The study recommended building on the findings by delivering further research to extract fibers, and thus develop value-added byproducts from date pits, which can bring economic benefit. The fibers have wide application, such as in reinforcing cement-based materials, for bioplastics, and as pharmaceuticals, supplements, and food additives.

The health functionality of the fibers depends on their types, such as soluble or insoluble. Soluble fibers are more effective in controlling irritable bowel syndrome, blood cholesterol levels, and diabetes, whereas insoluble fibers are important in reducing constipation because they help to increase excretion.

# Impact of Organizational Support on Faculty CTAA

Dr. Yasser Al-Hindawi Al-Mahdi

## Significance

The study has both theoretical and practical importance. From a theoretical point of view, it deals with the phenomenon of perceived organizational support (POS), which can impact the efficiency of university education performance and commitment of faculty members. From a practical perspective, the study suggests a set of measures aimed at increasing faculty commitment to academic accreditation (CTAA), which could help leaders and university decision makers to improve the quality of education at the University and enhance its position in world university rankings.

## Objectives

- Measure faculty members' POS and CTAA.
- Uncover the impact of different demographic variables in this regard.

## Study sample

The research covered all the 1152 faculty members at SQU and the Preparatory Studies Center, whereas 221 faculty members actually responded to the study's questionnaire.

## Results

- SQU faculty members showed a high level of CTAA.
- They reported a moderate degree of POS.
- POS positively affects the faculty's CTAA.
- Compared to Omanis, expatriate faculty reported significantly more POS.
- Female faculty, especially those in administrative positions, reported significantly higher CTAA than males, although male faculty reported significantly more POS.

## Recommendations

- Expanding the patterns of POS for faculty to increase CTAA, through developing the rewards and incentives system to be linked to their performance in the programmatic and institutional accreditation at the university level as a whole and within various academic units.
- Strengthening the culture of POS and enhancing the faculty members' commitment to the values, vision, and goals of the University, through regular positive messages that appreciate the importance of their role in achieving them.
- Finding appropriate mechanisms for equally distributing the functional burdens associated with academic accreditation among the members, and informing them in an accurate and specific manner of what is required of them.
- Encouraging job rotation in administrative positions at the University to provide an opportunity for a larger number of members to assume responsibility and carry out academic accreditation tasks, and to value the huge efforts made in this respect.
- Delivering programs and publications aimed at raising faculty awareness about POS.
- Developing training programs for sharing experiences between the most and least committed groups.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