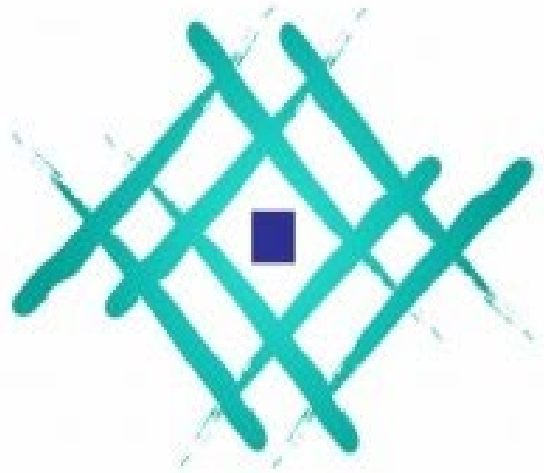


University Report on SDG 6



جامعة القصيم
Qassim
University

6 CLEAN WATER AND SANITATION



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SDG6: CLEAN WATER AND SANITATION

Qassim University's Commitment to SDG 6: Ensuring Clean Water and Sanitation through Water Conservation and Research

Sustainable Development Goal 6 (SDG 6) focuses on ensuring clean water and sanitation for all, recognizing the fundamental importance of access to safe and clean water resources. In Saudi Arabia, addressing water waste and ensuring sustainable water management is essential due to the region's arid climate. Qassim University acknowledges the significance of SDG 6 and has embarked on initiatives to contribute to water conservation, efficient water use, and research on water resources.

Water Conservation Initiatives:

Qassim University's commitment to SDG 6 is evident through its water conservation initiatives. The university implements measures to reduce water consumption on its campus, such as installing water-efficient fixtures, using recycled water for non-potable purposes, and promoting water-saving behaviors among students and staff.

Research on Water Resources:

The university actively engages in research projects focused on water resources, quality, and management. Qassim University's research contributes to a better understanding of the challenges related to water availability, pollution, and efficient utilization in the region. This research informs policy decisions and promotes sustainable water management practices.

Promotion of Water-Efficient Technologies:

Qassim University promotes the use of water-efficient technologies through its curriculum and research initiatives. The university educates students about innovative technologies that reduce water waste, such as drip irrigation systems and smart water management solutions. This knowledge empowers future professionals to contribute to water conservation efforts.

Awareness Campaigns and Workshops:

The university organizes awareness campaigns, workshops, and seminars to educate students, faculty, and the community about the importance of water conservation and responsible water use. These initiatives raise awareness about the finite nature of water resources and the collective responsibility to conserve them.

Partnerships with Water Management Agencies:

Qassim University collaborates with local water management agencies, governmental bodies, and non-governmental organizations to jointly address water-related challenges. These partnerships facilitate knowledge sharing, research collaboration, and the development of strategies to improve water quality and availability.

Research on Water Treatment and Purification:

The university's research efforts extend to water treatment and purification technologies. Qassim University contributes to the development of effective and sustainable methods for treating wastewater, improving water quality, and ensuring that water resources remain safe for consumption and use.

Incorporation of Water Sustainability in Curriculum:

Qassim University integrates the principles of water sustainability into its curriculum. The university offers courses that cover topics such as water management, water quality assessment, and

sustainable water use practices. This ensures that students across disciplines develop a comprehensive understanding of water-related challenges and solutions.

Community Engagement for Water Conservation:

The university engages with local communities through outreach programs that promote water conservation. Qassim University collaborates with schools, community centers, and local organizations to raise awareness, provide educational resources, and encourage water-saving behaviors among residents.

Qassim University's dedication to SDG 6 is evident through its holistic approach to addressing water waste, efficient water management, and research on water resources. By implementing water conservation measures, conducting research, promoting water-efficient technologies, raising awareness, fostering partnerships, and integrating water sustainability into education, the university plays a crucial role in ensuring clean water and sanitation in Saudi Arabia. Through its commitment, Qassim University contributes to safeguarding this essential resource for current and future generations.

Treating Water

<https://twitter.com/QassimUniv1/status/1642430149583929344> [1]

524 thousand cubic meters annually of treated water are invested to enhance the vegetation cover in the university city with [#جامعة_القصيم](#)



From [الإخبارية - آخر الأخبار](#)

Qassim Water Treatment

<https://wetico.com/?project=qassim-university> [2]

Apart from the supplied water treatment plant & pump station. The sewage treatment plant of average capacity equals to 5250 m³/d & can be extended to a maximum capacity up to 13125 m³/d. It consists mainly of two treatment streams, each stream of 2625 m³/d capacity; using a very convenient treatment method called RBC (Rotating Biological Contractors).

The wastewater treatment plant is designed to treat the wastewater that coming from the different facilities inside the university. Suspended solids and biodegradable organic matter are reduced through the treatment system to the acceptable limit for irrigation.



Executive Summary of April 2022

<https://services.qu.edu.sa/laravel-filemanager/files/shares/%D9%85%D9%84%D8%AE%D8%B5%20%D9%8A%D9%86%D8%A7%D9%8A%D8%B1.pdf> [3]



المخلص التنفيذي لشهر إبريل ٢٠٢٢ م

تم في هذا الشهر تقديم جميع الخدمات المطلوبة من الإدارة العامة للصيانة والخدمات واستمرت عملية تشغيل وصيانة مرافق ومباني الجامعة وأعمال الصيانة بأعلى كفاءة وتم إنجاز جميع المهام المطلوبة من الإدارة. كما تم تخطيط وتنسيق العديد من النشاطات والأعمال لتحسين وتطوير العمل بالإدارة وزيادة نسبة الرضا لدى منسوبي الجامعة.

10,354 cubic meters of sewage water were drained into the facilities and buildings of the university city and transported across 21 substations to the main station to be processed triple via the antenna rotation system without any stoppage

- تم تصريف 10354 متر مكعب من مياه الصرف الصحي في مرافق ومباني المدينة الجامعية ونقلها عبر 21 محطة رفع فرعية إلى المحطة الرئيسية لمعالجتها ثلاثياً عبر نظام التدوير الهوائي دون أي توقف

Water Plant Operation and Maintenance Section

<https://services.qu.edu.sa/content/p/56> [4]



The Green KSA Initiative

<https://twitter.com/QassimUniv1/status/1670478362530181120> [5]



From الإخبارية - آخر الأخبار

Within the #الخضراء_السعودية initiative and to achieve the goals of the Kingdom's Vision 2030.

#القصيم contributes to increasing the vegetation area within the university city and benefiting from approximately 524 thousand cubic meters of treated water to reduce the effects of desertification

Searching for sustainable solutions for Saudi Arabia

<https://www.timeshighereducation.com/hub/p/searching-sustainable-solutions-saudi-arabia> [6]



Researchers at Qassim University are using the latest technologies to find sustainable power sources and environmentally friendly water management techniques

From turning date palm tree waste into renewable energy to harnessing the power of the sun, Qassim University is on a mission to find sustainable power solutions.

Investigating sustainable developments in energy, water and environmental engineering is one of the university's 10 priorities, set out in its 2020 to 2024 research strategy.

Sustainable technologies are crucial in Saudi Arabia, where wastewater, municipal and construction waste and air pollution pose environmental threats. The Saudi Vision 2030 has set a target to power half the country with renewable resources by 2030.

Qassim University is working on a host of solutions, from sludge management and waste recycling to sea and groundwater desalination.

One notable project, led by Professor Sulaiman Alyahya, is examining how this waste from date palm trees can be transformed into renewable energy.

The central Al-Qassim province has more than 8 million date palm trees. The trees produce a large amount of agricultural waste including dry leaves, stems and seeds. "A quarter of the date palm is waste and many of the farmers burn that waste, which of course produces CO₂ emissions and harms the environment," says Alyahya. "We are really concentrating on how to convert this waste to energy."

An international group of researchers, including scientists from Iowa State University, is investigating how the latest technologies can turn the waste into renewable energy forms like biomass, bio-oil and biogas.

The researchers are using the new technique of autothermal pyrolysis, developed by Iowa State University's Bioeconomy Institute. The process is simpler and cheaper than conventional pyrolysis and does not require an external energy source.

"If we achieve this goal to convert the waste of date palms into energy, Saudi Arabia will have a reduction of almost 8,000 tonnes of CO₂ emissions," says Alyahya. "We will stop burning the waste of agriculture and at the same time create richer products."

Solar power research is another focus for Qassim University. Dr Muhannad Alaraj, an assistant professor in the university's Department of Electrical Engineering, is exploring how photovoltaic panels can transform light into power.

"We are investigating the economic effectiveness of PV panels in the Al-Qassim region. We're also studying the effect and forecasting for those PV panels and we currently have a small PV system from which we are collecting the data," says Alaraj.

"We have to consider the weather conditions and meteorological parameters. This is really important because in our region we have mostly sunny days, but sometimes there are sandstorms or clouds. We are trying to see the effect of this weather on PV panels. This will be really helpful to build a model to predict or estimate how much power or energy we will get from this PV panel each day."

As one of the world's most water-scarce nations, Saudi Arabia also needs innovative ideas for renewable water sources.

Dr Saleem AlSaleem, from the College of Engineering, is working on water and wastewater treatment, such as greywater treatment and using solar energy to treat saline water. His team is also developing solutions for solid waste management and tackling noise pollution.

AlSaleem is a member of the university's Sustainable Development Centre, which oversees Qassim's progress in its sustainability initiatives. The centre runs four greening projects, focusing on the curriculum, the campus, research and the university as an organisation.

AlSaleem and his colleagues say collaborating within and outside the university is important for a successful research project. Qassim's scientific research deanship has launched a number of international cooperation grants and encourages faculty members to apply. "We can improve our work by encouraging collaboration," says AlSaleem. "I am working with water companies and municipalities inside Saudi Arabia, and we also collaborate with researchers outside the country. For example, I am working with one professor in Malaysia and another in Italy."

The university's future research into sustainable developments will be boosted by a recently announced research chair for artificial intelligence. The chair will fund studies into AI across the university, including in agriculture and engineering.

"I'm currently working with five teams to see the role artificial intelligence can play in agriculture and renewable energy," says Alyahya.

[His Excellency the Rector inaugurates the First International Conference on the Sustainability of Natural Resources](#)

<https://qu.edu.sa/content/news/1531> [7]

H.E. Prof. Dr. Abdulrahman bin Hamad Al-Daoud, Rector of the University, stressed that achieving environmental sustainability is one of the most important pillars of the Kingdom's Vision 2030, in order to raise the efficiency of waste management and reduce pollution, as the Kingdom as an active member of the international system, especially in the Group of Twenty, which seeks to achieve the United Nations goals of sustainable development, pointing out that the issue of waste management is linked to a number of UN goals, including industry, innovation, infrastructure, sustainable cities, sustainable production and consumption, as well as reducing climate change.

This came during the patronage of His Excellency the Rector of the University, for the First International Conference on the Sustainability of Natural Resources: Sustainable Management of Solid Waste, which began on Tuesday morning, 8/3/1441 AH, and which is organized by the Faculty of Engineering at the University and the Center for Sustainable Development, at the headquarters of the main lobby in the University City for men, and for women in the theater of the Faculty of Economics and Management, over two days with the participation of 36 speakers to cover all the axes and objectives of this scientific meeting, which aims to discuss the necessary measures to transform into sustainable food systems.

Al-Daoud added that the university seeks to achieve sustainability through its centers, research and scientists, through a system of integration and cooperation between its units, educational and research programs, thanking the sponsors of the conference, the Qassim Municipality, and all contributing sectors inside and outside the university.

His Excellency the Rector also inaugurated the exhibition accompanying the conference, in which 6 government and private entities participate, including a corner for the Qassim Municipality, a corner

for the College of Engineering, a corner for the Center for Sustainable Development, a corner for the City Cement Company, the Cleaning Machinery Factory Company Ltd., and the Fahad Company, and witnessed the signing ceremony of a memorandum of cooperation between the Faculty of Engineering at the University and the City Cement Company.

For his part, the Chairman of the Organizing Committee of the Conference, Prof. Dr. Khalid Bani Al-Harbi, Vice President for Planning, Development and Quality, spoke about the importance of this conference, which comes in harmony with the University's sense of its strategic role in the Kingdom in general and in the region in particular, and as an embodiment of the aspirations of the Kingdom emanating from its Vision 2030, which gave great importance to the economic fields and the areas of quality of life, pointing out that the University has adopted a number of academic activities to embody this role, the most important of which is this type of scientific meetings, in addition to supporting research in This field and the inclusion of sustainability concepts in the courses of academic programs, and recently the launch of the sustainable university project supervised by His Excellency the Rector of the University and under the patronage of His Royal Highness Prince Dr. Faisal bin Meshaal bin Saud bin Abdulaziz, Amir of the region.

Al-Harbi added that the Organizing Committee has held more than 12 lengthy meetings to prepare for the conference, while the meetings of the other executive committees exceeded more than 30 working meetings, 19 of which were for the Scientific Committee, and the working hours of the preparatory team amounted to more than 150 working hours, and the working group included more than 36 members, and this work resulted in the participation of more than 15 countries with 168 participants, and more than 120 scientific papers were arbitrated.

Al-Harbi explained that the organizing committee and those in charge of this conference, which is dedicated to sustainability concept and research through participants and interested parties, decided that the conference should go beyond this to be sustainable even with an organizational printer, offering thanks and appreciation to partners for success represented by the strategic partner City Cement Company, the silver sponsor Al-Fahad Company, the supporting sponsor of the Qassim Municipality, and the parties cooperating with the conference, which comes at the forefront of which is the Ministry of Environment, Water and Agriculture represented by the Environment Agency and the Ministry's branch in the region represented by His Excellency Eng. Salman Al-Suwaina, as well as The General Directorate of Education in the region is represented by His Excellency Mr. Saleh Al-Jasser for their constructive cooperation to make this conference a success.

After that, the Dean of the Faculty of Engineering, Dr. Meshal bin Ibrahim Al-Mushaiqah, said that the Faculty of Engineering at the University attaches great importance to the topics of sustainability of natural resources for their specialized nature, to be one of the most important arms of the University to achieve this lofty purpose next to the relevant specialized authorities from colleges and other units, the most important of which is the Center for Sustainable Development at the University, as a partner in the organization and incubator of the conference with the College in the establishment of this qualitative international forum.

He pointed out that the conference aims to show the size of natural and economic resources wasted and estimate the environmental cost of waste, as well as discuss the necessary measures to transform into sustainable food systems where waste is reduced and food waste is reduced, in addition to stimulating integration between partners from different disciplines to manage waste in a sustainable manner, studying opportunities to stimulate investment in the development of waste recycling technologies in the Kingdom, and studying the obstacles to investment in the field of waste manufacturing industries, through several axes discussed by the conference, namely: Effective

management, valued food and responsible citizen, attractive and ambitious investment, and a cohesive team to protect and sustain the environment.

The organizers of the conference seek to contribute to the preparation of a vision on sustainable solid waste management at the national and global level, through the participation of a number of experts, academics and specialists from 15 countries in this field and discuss the results of the latest studies, research and scientific papers related to sustainable solid waste management through 6 sessions throughout the two days of the conference, in order to reduce the per capita consumption rates in the Kingdom of Saudi Arabia of some goods and services, which come within the highest rates globally, which increased the volume of solid waste generated, Reducing the depletion and degradation of natural resources due to high consumption rates, and transferring and localizing modern international technologies in the field of waste management in accordance with the conditions of the Kingdom.

The Dean of the College of Engineering added that the conference also seeks to address the challenges arising from waste, which is the responsibility of each member of society, raise community awareness of the risks posed by waste generation, encourage initiatives aimed at improving sustainable waste management, and provide an opportunity to exchange experiences and knowledge among specialists in waste management and sustainable development.

Hence, the speech of the sponsors was delivered by the Executive Director of City Cement, Mr. Majid bin Abdulrahman Al-Assilan, in which he stressed the existence of millions of tons of municipal waste estimated at billions of riyals, which contain organic and inorganic materials of foods and yes God love this blessed country and other materials that could have been recycled and converted into energy to achieve added value to the homeland, but unfortunately they end up in landfills, which is a kind of waste and contradicts our Islamic values and teachings. to the negative environmental impacts resulting from the backfilling of waste in the ground, some of which take more than 100 years to decompose in nature.

Al-Osailan pointed to the risks of leakage of some harmful substances from those residues to the soil and groundwater or the risk of fires, pointing out that most of the developed European countries such as Germany, the Netherlands and Belgium have a total amount of waste destined for landfills is almost zero, where no waste is backfilled and if necessary a very high fee is paid on the landfill to reduce these practices and protect the environment, by replacing the use of petroleum fuels with renewable energy and primitive fuels, offering sincere thanks and appreciation To all colleagues at the university and those in charge of this conference, for their blessed efforts and for what will contribute to achieving the directions of our wise government of raising awareness regarding the environment and sustainability, supporting coordination between the public and private sectors, and contributing to the achievement of the Kingdom's Vision 2030 to place the Kingdom in the ranks of developed countries.

For his part, the Director of the Center for Sustainable Development, Mr. Ibrahim bin Saleh Al-Rabadi, spoke about the vision of the Center for Sustainable Development at the University for sustainability through the adoption of a balanced integrated approach to achieve equitable development between regions and generations, each takes his right and each carries out his duty towards his environment, society and economy to complete the three clusters of sustainability, and sustainability addresses the issue of waste in its physical, technical, social, technical, informatics, financial and economic dimensions.

Al-Rabadi explained that waste management is linked to a number of UN goals, especially the ninth goal, which is industry, innovation and infrastructure, the eleventh goal related to sustainable cities,

the twelfth goal on sustainable production and consumption, and the thirteenth goal, which is concerned with reducing climate change, and it is hoped from this conference to seek to diagnose problems accurately and develop appropriate solutions by scientists and experts gathered, and we hope that the objectives of this conference will be achieved and its recommendations translated into useful practical projects.

The conference witnessed the presence of the Vice President of the University, Dr. Mohammed Al-Saawi, the Vice President for Educational Affairs, Dr. Mohammed Al-Odaib, the Vice President for Graduate Studies and Scientific Research, Prof. Dr. Ahmed Al-Turki, Eng. Salman Al-Suwaina, Director of the Branch of the Ministry of Environment, Water and Agriculture in Qassim, Mr. Saleh Al-Jasser, Director of the Department of Education in the Qassim Region, Eng. Abdulmohsen Al-Faraihi, Director of the Directorate of Water in Qassim, Eng. Abdulaziz Al-Saleem, Deputy Secretary of the Qassim Region, and the deans of the faculties, faculty members and students at the University.

The University Receives a Delegation from the Ministry of Environment, Water and Agriculture

<https://www.qu.edu.sa/content/news/2457> [8]



The University, represented by the Faculty of Agriculture and Veterinary Medicine, received on Wednesday, 7/6/1442 AH, a delegation from the Ministry of Environment, Water and Agriculture, where the two parties held the second meeting to activate the memorandum of understanding between them to discuss cooperation in the fields of environmental conservation, and then the delegation toured a number of colleges at the headquarters of the University City, including the Faculty of Agriculture and Veterinary Medicine, the College of Engineering, the Faculty of Science, and the Faculty of Economics and Management.

This meeting comes as an activation of the memorandum of understanding signed between the University and the Ministry of Environment, Water and Agriculture to cooperate in the fields of the environment in an effort to benefit each party from the capabilities and expertise of the other party, where the meeting discussed the tasks of the members of the two teams, and the efforts exerted by each party in the field of awareness of the need to preserve the environment and increase green spaces and ways to achieve integration between them for the benefit of all society.

They also discussed the needs of the two sides and how to exchange experiences between them in the field of academic and training programs, whether at the level of intermediate and high diplomas, or undergraduate and graduate programs, where the university team participating in the meeting

reviewed the definition of the scientific, research and expertise capabilities of the university and its colleges in several areas needed by the environment sector.

For its part, the Ministry's delegation made short presentations to introduce the environment sector, the work of the Environment Agency at the Ministry, which included the National Environment Strategy, the Ministry's efforts in developing vegetation cover and combating desertification, as well as the Ministry's efforts in protecting and managing national parks, in addition to its efforts in environmental awareness, and the needs of national environmental centers for academic programs.

Network Water Quality Conference in Buraidah continues its activities

<https://www.spa.gov.sa/1823762> [9]



The Network Water Quality Conference continued its activities today, at the King Khalid Cultural Center in Buraidah, where three dialogue sessions were held that included 8 working papers.

The first session, chaired by the Vice President of Qassim University for Graduate Studies and Scientific Research, Dr. Ahmed Al-Turki, discussed three working papers on the first of which came under the title **"Quality of groundwater"** by Dr. Hussein Al-Ajmi Groundwater, where he explained that **it constitutes approximately 98% of fresh water and constitutes almost 60% of the sources of drinking water supply projects in the Kingdom, while the second paper was entitled "Plastic pipes used for drinking water in networks and homes" in which Engineer Turki Al-Shahrani talked about the advantages of plastic pipes and that they Environmentally friendly, while Dr. Ahmed Al-Arifi presented the third paper entitled "Desalination Industry in the Kingdom of Saudi Arabia" in which he touched on the water challenges facing the Kingdom and the history of the desalination industry and some statistics locally and globally.**

The second session, chaired by the Director General of the Water Regulation Department at the Ministry, Dr. Abdulaziz Al-Shuaibi, discussed three working papers, the first of which dealt with "Promising desalination methods" presented by Dr. Ibrahim Al-Mutaz, in which he explained that there are techniques still in the process of experimentation such as desalination by the process of humidification, dehumidification, desalination by freezing method and others, and the second paper

discussed the topic of "Optimal design of water purification plants to reduce waste from wastewater" by Dr. Mohammed Heikal, in which he explained that water purification plants produce daily quantities of The third paper was entitled "Specifications of transported water and its impact on the shelf life of transport systems and their reflection on the quality of water arriving to the consumer" presented by Dr. Saud bin Murshid, in which he highlighted the operational technical specifications applied to the transport systems of sweet water in the Kingdom.

The third session, chaired by Dr. Bader Al-Baridi, former Director of Studies and Designs Department at the General Directorate of Water in Qassim, dealt with two working papers, the first of which discussed the topic of "Protection of buried carbon iron pipes used in the transport of water from corrosion", in which Eng. Hamad Ababtain spoke about the importance of protecting carbon iron pipes because it is the nerve of the project to continue serving as long as possible, while the second and last paper in this session was presented by Dr. Ali Al-Hamza entitled "Monitoring of organic and inorganic pollutants in the water produced." From the plants of the Saline Water Desalination Corporation" in which he pointed out that the World Health Organization's standard specifications for drinking water showed the results that organic and inorganic pollutants in the water produced from desalination plants are within the limits allowed by the World Health Organization.

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