



# SDG 6: Clean Water and Sanitation



The University of Tabuk is dedicated to efficient use of natural resources, particularly water. It actively promotes water conservation on campus and operates a wastewater treatment plant utilizing Membrane Bio Reactor technology.

### 6.1 Research on water

The university significantly contributes to research in the field of water services and sanitation, as demonstrated by its increasing number of publications in these areas, reflecting its commitment to addressing global water challenges. Some examples of this research include:

- **Aljohani, M.M., Al-Qahtani, S.D., Alshareef, M., El-Desouky, M.G., El-Bindary, A.A., El-Metwaly, N.M. and El-Bindary, M.A., 2023.** Highly efficient adsorption and removal bio-staining dye from industrial wastewater onto mesoporous Ag-MOFs. *Process Safety and Environmental Protection*, 172, pp.395-407.
- **Alrefaee, S.H., Aljohani, M., Alkhamis, K., Shaaban, F., El-Desouky, M.G., El-Bindary, A.A. and El-Bindary, M.A., 2023.** Adsorption and effective removal of organophosphorus pesticides from aqueous solution via novel metal-organic framework: Adsorption isotherms, kinetics, and optimization via Box-Behnken design. *Journal of Molecular Liquids*, 384, p.122206.
- **Saeed, M., Albalawi, K., Khan, I., Akram, N., Abd El-Rahim, I.H., Alhag, S.K. and Ahmed, A.E., 2023.** Synthesis of pn NiO-ZnO heterojunction for photodegradation of crystal violet dye. *Alexandria Engineering Journal*, 65, pp.561-574.

### 6.3 Water usage and care

#### 6.3.1 Wastewater treatment

The university of Tabuk uses advanced Membrane Bio-Reactor (MBR) technology, as detailed in the Water Treatment Plant Report (STP). This system is crucial to the university's water sanitation efforts, ensuring efficient and sustainable water management

[https://drive.google.com/drive/u/0/folders/1jknf8MnkcZJ0hAEKo7b\\_75GTXI78aGc1](https://drive.google.com/drive/u/0/folders/1jknf8MnkcZJ0hAEKo7b_75GTXI78aGc1)



#### 6.3.2 Preventing water system pollution

The University of Tabuk conducts regular inspections and maintenance of its facilities to prevent pollution and operates a comprehensive

hazardous waste management program to ensure the safe handling, storage, and disposal of hazardous materials.

**Regular Inspections and Maintenance:** We conduct regular inspections and maintenance of all facilities, including laboratories and storage areas, to ensure that potential sources of pollution are in good condition and operating correctly.

<https://www.ut.edu.sa/ar/administration/Agency/Department-Operation-Maintenance/Pages/default.aspx>

**Hazardous Waste Management:** The university has a robust hazardous waste management program that includes the proper segregation, storage, and disposal of hazardous materials. This program ensures that hazardous substances are not improperly released into the environment.

<https://www.ut.edu.sa/ar/administration/Agency/Occupational-Safety-Health-Administration/Documents/%D8%AF%D9%84%D9%8A%D9%84%20%D9%82%D9%88%D8%A7%D8%B9%D8%AF%20%D8%A7%D9%84%D8%B3%D9%84%D8%A7%D9%85%D8%A9.pdf>

<https://www.ut.edu.sa/ar/administration/Agency/Occupational-Safety-Health-Administration/Documents/%D8%AF%D9%84%D9%8A%D9%84%20%D8%A7%D9%84%D8%B3%D9%84%D8%A7%D9%85%D8%A9%20%D8%A8%D8%A7%D9%84%D9%85%D8%B9%D8%A7%D9%85%D9%84%20%D9%88%D8%A7%D9%84%D9%85%D8%AE%D8%AA%D8%A8%D8%B1%D8%A7%D8%AA.pdf>

### 6.3.3 Free drinking water provided

The University of Tabuk has established a set of executive rules regulating the affairs of non-Saudi scholarship students (both genders), including those related to the benefits for external scholarship recipients. These benefits, as stipulated in the regulations governing the financial affairs of universities, include providing health care to

students and their family members, discounted meals, accommodation, travel tickets, access to clean water, and other essential services

### Providing discounted meals for non-Saudi scholarship students P 4-5.

<https://www.ut.edu.sa/ar/Deanship/student-affairs/Documents/%D8%B7%D9%84%D8%A8%20%D9%85%D9%86%D8%AD%D8%A9%20%D8%AF%D8%B1%D8%A7%D8%B3%D9%8A%D8%A9%20%D9%84%D8%BA%D9%8A%D8%B1%20%D8%A7%D9%84%D8%B3%D8%B9%D9%88%D8%AF%D9%8A%D9%8A%D9%86.pdf>

### 6.3.4 Water-conscious building standards

The University of Tabuk, through the University Vice Presidency and its specialized units, is keen to rationalize water consumption by concluding agreements to implement building standards aimed at reducing water use.

#### Partnership Agreements 1 (page 5& 11)

<https://www.ut.edu.sa/ar/administration/vrgssr/Partnerships-and-International/Pages/default.aspx>

#### Water research community day

[https://x.com/u\\_tabuk/status/1777090825052196874?s=48](https://x.com/u_tabuk/status/1777090825052196874?s=48)

#### World Water Day

[https://x.com/dsa\\_ut/status/1787544846401442012?s=48](https://x.com/dsa_ut/status/1787544846401442012?s=48)

### 6.3.5 Water-conscious planting

There is a committee at the university responsible for developing a strategic plan for afforestation and landscaping. The committee's tasks include identifying suitable and drought-resistant plants



[https://drive.google.com/drive/u/0/folders/1jknf8MnkcZJ0hAEKo7b\\_75GTXI78aGc1](https://drive.google.com/drive/u/0/folders/1jknf8MnkcZJ0hAEKo7b_75GTXI78aGc1)

## 6.4 Water reuse

### 6.4.1 Water reuse policy

While there is no formal policy in place, the University of Tabuk supports the recycling of treated wastewater for beneficial purposes, such as agricultural and landscape irrigation, as well as industrial processes. This is achieved through the university's support for research in these areas.

### Water research community day

[https://x.com/u\\_tabuk/status/1777090825052196874?s=48](https://x.com/u_tabuk/status/1777090825052196874?s=48)

## 6.5 Water in the community

### 6.5.1 Water management educational

The University of Tabuk is making every effort to rationalize water consumption on campus by sending awareness emails, as well as by launching initiatives aimed at educating male and female students about rationalizing water use. It also cooperates with government sectors specialized in water desalination to share its scientific, research and technical expertise that aims to find solutions for managing water use in a way that serves sustainable environmental development.

[https://x.com/dsa\\_ut/status/1787544846401442012](https://x.com/dsa_ut/status/1787544846401442012)

[https://x.com/u\\_tabuk/status/1777090825052196874?s=46&t=TRyN4HDVhNuZLwM4vITAoQ](https://x.com/u_tabuk/status/1777090825052196874?s=46&t=TRyN4HDVhNuZLwM4vITAoQ)



### 6.5.2 Promoting conscious water usage

Specialized units at the University of Tabuk, such as the Center for Renewable Energy and Environmental Technology, play a key role in disseminating awareness messages about the importance of rationalizing water consumption. They communicate these messages to all university employees and students through official emails.

The University of Tabuk, through its Vice Presidency and specialized units, is committed to rationalizing water consumption by entering into agreements to implement building standards aimed at reducing water use. The Center for Renewable Energy and Environmental Technology further contributes by promoting awareness about the significance of conserving water among all university employees and students through official emails.

The University of Tabuk is leading several innovative research projects related to water, aimed at developing technologies that enhance quality of life, promote resource sustainability, and drive economic prosperity in alignment with the Kingdom's Vision 2030.

### For students and society:

[https://x.com/dsa\\_ut/status/1787544846401442012](https://x.com/dsa_ut/status/1787544846401442012)

### Water Research Association

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/Pages/NewsDetails.aspx?NewsID=5>

### Water extraction project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Mariner%20and%20Water%20Extraction%20Project.jpeg>

### Monitoring water quality project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Water%20quality%20Project.jpeg>

### Removing biological condensate in underwater suction pipes project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Biofouling%20Project.jpeg>

### 6.5.3 Off-campus water conservation support

The University of Tabuk cooperates with government sectors specialized in water desalination to share its scientific, research and technical expertise that aims to find solutions for managing water use in a way that serves sustainable environmental development. For example: Establishing a water research community initiative (cooperation between the University of Tabuk - Research Center for Artificial Intelligence and Sensor Technologies with the Saline Water Conversion Corporation, represented by the Water Technologies Innovation Institute

To discuss the challenges facing the water industry, the requirements for improving the desalination industry, and ways to develop new technologies with higher efficiency and lower cost

### For students and society

[https://x.com/dsa\\_ut/status/1787544846401442012](https://x.com/dsa_ut/status/1787544846401442012)

### Water Research Association

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/Pages/NewsDetails.aspx?NewsID=5>

### Water extraction project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Mariner%20and%20Water%20Extraction%20Project.jpeg>

### Monitoring water quality project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Water%20quality%20Project.jpeg>

### Removing biological condensate in underwater suction pipes project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Biofouling%20Project.jpeg>

### Water research community day

[https://x.com/u\\_tabuk/status/1777090825052196874?s=46&t=TRyN4HDvhNuZLwM4vITAoQ](https://x.com/u_tabuk/status/1777090825052196874?s=46&t=TRyN4HDvhNuZLwM4vITAoQ)

### 6.5.4 Sustainable water extraction on campus

The University of Tabuk works to adopt sustainable technologies that reduce environmental damage. For example: The University of Tabuk - Center for Research on Artificial Intelligence and Sensor Technologies cooperated with the Saline Water Conversion Corporation, represented by the Water Technology Innovation and Research Development Company (WTIIRA), in publishing a research paper.

Improving charge transfer properties and performance of solar cells by doped TiO<sub>2</sub> as an efficient photovoltaic code for dye sensitized

solar cells (DSSCs) as an alternative to conventional solar energy for its high ability to absorb energy from sunlight more efficiently and less expensively. This enhances the role of desalination in developing more effective and environmentally friendly applications in the field of sustainable energy and contributes to achieving the goal of zero carbon neutrality in the Kingdom.

[https://x.com/wtiira\\_ksa/status/1768240722275115057?s=12&t=TRyN4HDvhNuZLwM4vITAoQ](https://x.com/wtiira_ksa/status/1768240722275115057?s=12&t=TRyN4HDvhNuZLwM4vITAoQ)

<https://www.swcc.gov.sa/ar/News/NewsDetails/1193>

<https://www.swcc.gov.sa/uploads/watira%20news.pdf>



### 6.5.5 Cooperation on water security

The University of Tabuk cooperates with government sectors specialized in water desalination to share its scientific, research and technical expertise that aims to find solutions for managing water use in a way that serves sustainable environmental development. For example: Establishing a water research community initiative (cooperation between the University of Tabuk - Research Center for Artificial Intelligence and Sensor Technologies with the Saline Water Conversion Corporation, represented by the Water Technologies Innovation Institute

### Collaboration and partnership

[https://x.com/u\\_tabuk/status/1508447994848460812?s=46&t=TRyN4HDvhNuZLwM4vITAoQ](https://x.com/u_tabuk/status/1508447994848460812?s=46&t=TRyN4HDvhNuZLwM4vITAoQ)

<https://www.ut.edu.sa/ar/administration/vrgssr/Partnerships-and-International/Documents/Partnership%20Agreements%202.pdf>

<https://www.ut.edu.sa/ar/administration/vrgssr/Partnerships-and-International/Documents/Partnership%20Agreements%201.pdf>

### Water research community day

[https://x.com/u\\_tabuk/status/1777090825052196874?s=46&t=TRyN4HDvhNuZLwM4vITAoQ](https://x.com/u_tabuk/status/1777090825052196874?s=46&t=TRyN4HDvhNuZLwM4vITAoQ)

[https://x.com/u\\_tabuk/status/1786045919495881116?s=46&t=TRyN4HDvhNuZLwM4vITAoQ](https://x.com/u_tabuk/status/1786045919495881116?s=46&t=TRyN4HDvhNuZLwM4vITAoQ)

### 6.5.6 Promoting conscious water usage on campus

### 6.5.7 Promoting conscious water usage in the wider community

The University of Tabuk is committed to rationalizing water consumption through various initiatives and partnerships. Specialized units, such as the Center for Renewable Energy and Environmental Technology, play a vital role in this effort by disseminating awareness messages about the importance of water conservation to all university employees and students via official email communications. Additionally, the university, through its Vice Presidency and specialized units, is establishing agreements to implement building standards aimed at reducing water use. Furthermore, the University of Tabuk is leading several research and innovative projects related to water, focusing on the development of technologies that enhance quality of life, promote resource sustainability, and contribute to economic prosperity in alignment with the Kingdom's Vision 2030.

### Awareness campaigns

[https://x.com/dsa\\_ut/status/1787544846401442012?s=48](https://x.com/dsa_ut/status/1787544846401442012?s=48)

### Water research community day

[https://x.com/u\\_tabuk/status/1777090825052196874?s=48](https://x.com/u_tabuk/status/1777090825052196874?s=48)

### Water Research Association



<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/Pages/NewsDetails.aspx?NewsID=5>

### Water extraction project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Mariner%20and%20Water%20Extraction%20Project.jpeg>

### Monitoring water quality project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Water%20quality%20Project.jpeg>

### Removing biological condensate in underwater suction pipes project

<https://www.ut.edu.sa/ar/Centers/Artificial-and-Sensing/PublishingImages/Biofouling%20Project.jpeg>



Global Prize Innovation in Desalination

الجائزة العالمية للابتكار في تحلية المياه

٢٠٢٤

دعماً للابتكار والتميز، يسر عمادة البحث والدراسات العليا دعوة المختصين للتسجيل في الجائزة العالمية للابتكار في تحلية المياه، والمقدمة لأفضل الابتكارات والمشاريع البحثية العالمية في مجال تحلية المياه

بقيمة

10,000,000 دولار

مسارات الجائزة

- الاستفادة من المواد المتقدمة في إنتاج ومعالجة المياه
- عمليات مبتكرة عالية الكفاءة للتحلية الحرارية والتحليلة عن طريق الطاقة الشمسية
- تقنيات مبتكرة لتعظيم الاستفادة من الرجيع الملحي
- أنظمة إنتاج المياه الهجينة المتكاملة
- تقنيات محسنة لإزالة الملوثات المقلقة من مصادر المياه مثل الزئبق و PFAS، واليورون
- تحسين العمليات باستخدام الشبكات العصبية وتقنيات التعلم الآلي الأخرى
- الابتكارات الهادفة إلى الحد من الأثر البيئي والانبعثات الكربونية الناتجة عن إنتاج المياه
- استراتيجيات جديدة لخفض الحشف الجوي والترسيبات الحيوية الأخرى

الفئة المستهدفة:

مراكز الأبحاث الباحثون

وللإطلاع على شروط الجائزة والتسجيل فيها :

آخر موعد للتقديم: ٣٠-٦-٢٠٢٤م

عمادة البحث والدراسات العليا