SDG PROGRESS REPORT

on SDG-6 CLEAN WATER and SANITATION

2022

ISTANBUL MEDENIYET UNIVERSITY

SUSTAINABLE DEVELOPMENT GOALS

https://sdg.medeniyet.edu.tr

SDG PROGRESS REPORT

ISTANBUL MEDENIYET UNIVERSITY

Istanbul Medeniyet University
Sustainability Office

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6 CLEAN WATER AND SANITATION

Water scarcity affects more than 40 percent of people, an alarming figure that is projected to rise as temperatures do. Although 2.1 billion people have improved water sanitation since 1990, dwindling drinking water supplies are affecting every continent.

More and more countries are experiencing water stress, and increasing drought and desertification is already worsening these trends. By 2050, it is projected that at least one in four people will suffer recurring water shortages.

Safe and affordable drinking water for all by 2030 requires we invest in adequate infrastructure, provide sanitation facilities, and encourage hygiene. Protecting and restoring water-related ecosystems is essential.

Ensuring universal safe and affordable drinking water involves reaching over 800 million people who lack basic services and improving accessibility and safety of services for over two billion. In 2015, 4.5 billion people lacked safely managed sanitation services (with adequately disposed or treated excreta) and 2.3 billion lacked even basic sanitation.

UN SDG

WORLD

2,4 BILLION
people live in water-stressed countries

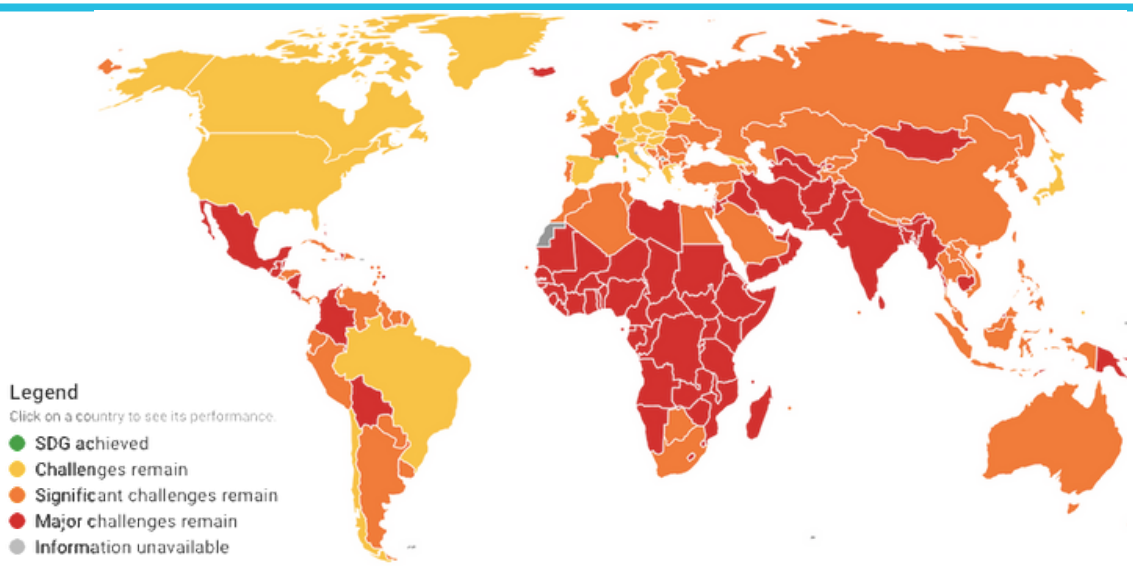
58%
portion of domestic wastewater treated safely in 2022

1,000 CHILDREN
die due to preventable water and sanitation-related diseases each day

9%
Water efficiency increase in 2022

2,2 BILLION
people lacked basic hand washing facilities in 2022

TURKEY



IMU

4.5 M³
Usage amount per campus member in 2022

68,128 M³
Total usage amount on IMU campuses in 2022

gray water recovery system

waste water filtration system

Water-saving solutions for all wet floor volumes

OPERATIONS

IMU

Water Consumption Tracking

With the awareness that water is the foundation for life and is not an unlimited resource, Istanbul Medeniyet University measures the amount of water used in all our campuses and develops strategies to reduce the water consumption per person. The amount of water consumed in all campuses of our university in 2022 was 68,123 m3 with an annual **water consumption per person of 4.5m3.**

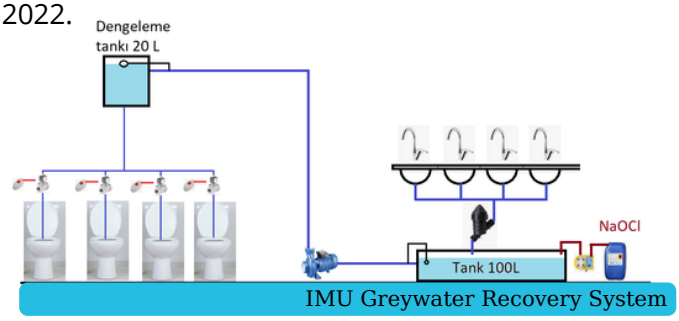
> **4.5M^3 WATER**
> consumed per campus community member

Distribution of the amount of water consumed in our campuses according to the types of water usage shows that green space irrigation has a significant share in water consumption. Therefore, certain measures are implemented in IMU campuses to reduce the amount of water used for green space irrigation. All the green spaces in our campus areas are irrigated by sprinkler systems. Irrigation is carried out through the stations installed with adequate intervals and the system is activated in the early morning and evening hours when evaporation is the lowest, thereby saving water. In addition, in areas where underground water usage is available, as in our Göztepe North and South Campuses, well water is also used as complementary to green space irrigation.

Wastewater Treatment

Wastewater from campus use is collected by the wastewater network and dispatched to the treatment facilities of Istanbul Water and Sewerage Administration (İSKİ), which is in charge of treating wastewater using various systems from preliminary treatment to advanced biological treatment so that wastewater is eliminated without environmental damage and water resources, Istanbul Strait, and the Marmara Sea are protected from the threat of wastewater.

As Istanbul Medeniyet University, we are developing projects for waters within our campus area that we can reuse after treatment. In 2021, the **"Greywater Recovery Project"** was initiated under the leadership of Prof.Dr. Erkan ŞAHİNKAYA and Asst.Prof.Dr. Yasin KARAGÖZ from IMU Faculty of Engineering and Natural Sciences. With this project, a system was designed that allows reusing the sink water in the restrooms for toilet flushing to reduce water consumption in our campuses. Designed system was implemented in the toilets in the North campus Block B Classroom Building in 2022.



IMU Greywater Recovery System

Preventing Water System Pollution

Istanbul Medeniyet University cleans the wastewater inside the campus areas using certain **filtering systems** before discharging it. For instance, we have oil filters installed in the dishwashing sites in our campus kitchen and other facilities to prevent the oily wastewater from polluting the discharged water. These filters are regularly cleaned and the oil waste collected are delivered to ISTAC Inc., an affiliation of Istanbul Metropolitan Municipality that is in charge of waste management.

Free Drinking Water Provided

Istanbul Medeniyet University has started developing projects to provide free water for everyone as a human right. We installed a water treatment system in our Ziraat Bank Library building to provide our campus community with free drinking water.

Water-Conscious Building Standarts

Istanbul Medeniyet University implements solutions to reduce water use in all its buildings and chiefly in its newly constructed buildings: photocell faucets in the washing basins, water saving recessed toilets etc.

LEADERSHIP

IMU

Prof.Dr. Erkan ŞAHİNKAYA, a faculty member of IMU Bioengineering Department, served as a consultant in the design and planning of the DOSAB **wastewater recycling facility**. DOSAB Wastewater Recyling Facility received the **best application award** in the 'Be Friends with the Environment Good Application Awards Competition' organized by Bursa Metropolitan Municipality in 2022 in order to highlight the good applications in the field of environment and to increase environmental awareness. Water scarcity and increasing water pressure in the world have brought the recycling of wastewater and the use of these waters as a new resource to the agenda. One of the most effective methods for water sustainability is Wastewater Recycle Systems. With the help of these systems, purified wastewater from enterprises and treatment plants can be brought to a quality that can be reused in enterprises by using advanced treatment techniques. Thanks to this facility, within a year; nearly 4 million cubic meters of the treated water is put into production again, protecting underground water resources, standing out as environmentally friendly and sustainable production, and making participating companies preferred in the international arena.

DOSAB Wastewater Recyling Facility

LEARNING

IMU

Learning processes are key in achieving SDGs. Thus, universities play a critical role both by training professionals who will prioritize SDGs in their future practices and by increasing local, national, and global capacity to successfully achieve SDGs. As Istanbul Medeniyet University, we are aware of our critical role and therefore, we primarily inform our students, the leaders and decision-makers of the future, about the Sustainable Development Goals through course contents, co-curricular activities and student club activities and strengthen their awareness. For this purpose, each of our faculties and departments prepares SDG-related course contents, including courses that address the Sustainable Development Goals holistically, as well as specific contributions that can be made by the expertise of the relevant professional field in which they provide training. In 2022, 8 bachelor degree courses related to SDG-6 were given at IMU.

Some of these are listed below.

Faculty	Course
Engineering and Natural Sciences	INS058 - Water Resources Engineering
	INS461 - Water Supply and Environmental Health
	BYM416 - Micropollutants, Treatment and Effects on Human Health
Health Sciences	SYB313 – Public Health
Political Science	ULİ462 – Environmental Problems and the World
	ULİ466 - Water Problem in the International Arena

IMU organized a workshop in partnership with Kadıköy Municipality to inform local people about the importance of clean energy and water need for energy production. **"ElectriCITY: Energy Preferences Game"**, a role game which the participants produce energy policies as decision makers in the energy production of the city, was played at the workshop. The workshop was organized by Ayça ÇELİKBİLEK, research assistant of our University's Sustainability Office, and geological engineer Gökhan SAPMAZ at the Kadıköy Environment Festival. At the beginning of the workshop, general information about the energy system and energy management used in cities was given. In this context, the participants were informed about primary energy sources such as fossil fuels, renewable energy sources and other energy sources. Finally, in order to understand why energy policies are important for the environment, information was given to the participants about air pollutants, greenhouse gases and water consumption resulting from source selection in energy production. ÇELİKBİLEK informed that 51% of fresh earth water withdrawals are used for electricity. Thus, the participants were made to understand the importance of energy management in the global climate and water crisis. In the second part of the workshop, the game, which is a simple simulation of the energy system in cities, was introduced to the participants and the game started. The game, which was designed as a simulation of real life, was played as 6 different stages. And one of this stage is especially designed to provide a deep insight into the water consumption created by energy choices. Water consumption was kept at a certain limit in this stage and it was discussed how the changes in political, economic and environmental conditions reflected on the energy policies produced by the groups and how these policies were reflected on the environmental costs in addition to the construction and operating costs.

"ElectriCITY: Energy Preferences Game"

IMU Sustainability Office regularly informs the public about environmental issues through its social media accounts. Every year in July, the Office carries out various activities to reduce the amount of plastic use and as part of its **plastic-free July activities** in 2022, it shared daily posts aiming to raise awareness about the harmful environmental impact of plastic materials, encourage people to reduce their plastic use, and invite them to use eco-friendly alternatives that do not produce plastic waste. Each of these notifications reached an average of 350 people.

For instance, on July 22, 2022, Sustainability Office informed the public about the harmful environmental effects of single-use ball pens through its social media account. The related post included the information that the residual ink in single-use ball pens contaminate the soil and water, and also, the plastic parts of these pens cannot be recycled.

On July 24, 2022, IMU Sustainability Office informed the public about the harmful environmental effects of single-use plastic straws. The related post included the information that today global coastal areas contain 8.3 billion plastic straws, which can drift into and pollute waterways and the seas. And as non-recyclable items, they pose deadly risks for marine life.

On July 29, 2022, the public was encouraged to use reusable, eco-friendly shopping bags instead of plastic ones via IMU Sustainability Office's social media account. The related post informed that the average duration of use for a plastic bag is 12 minutes; yet, it could take upto 1000 years for plastic bags to decompose in nature. And during decomposition, they release harmful chemical in the environment, slowly contaminating the food chain. Every year, over 1 million seabirds die from plastic pollution.

Plastic-Free July posts by IMU Sustainability Office

At the end of the month, another post was shared, providing information about the potential gains from all these habit changes for cleaning the seas and oceans, preventing global warming and reducing waste generation.

RESEARCH

The academic staff members of our university carry out research on providing safe and affordable drinking water; ending open defecation and achieving access to sanitation and hygiene; improving water quality, wastewater management, and safe reuse of water; increasing water-use efficiency and ensuring supply of freshwater; implementing integrated water resources management; protecting and restoring water-related ecosystems; expanding support to developing countries in water- and sanitation-related activities; supporting local participation in improving water and sanitation management, publish the results of their research and share them with other researchers, decision-makers, stakeholders, and the public as a foundation for policies toward achieving SDGs.

Prof.Dr. Nureddin TÜRKAN and PhD graduate Hüseyin Enis KARA of IMU Faculty of Engineering and Natural Sciences published a research article investigating **"The Effects of Thermal Water Released from Nuclear Plants on the Water Ecosystem"**. In the study, the importance of the side effects of the energy obtained from nuclear power plants was emphasized, the damage they could cause to the environment and the water ecosystem was taken into account, and a systematic review was made by considering the benefit/ harm relationship. The study is based on the literature and discussed the effects of thermal waters released from nuclear power plants (NPPs) on the natural ecosystem both in terms of environment and living organisms. They concluded that In the long term, the number of scientific studies should be increased to determine both the effects of NPPs on the increase in sea water temperature globally in terms of CO2 emissions and how much the cumulative rate increases with discharge water.

In the study **"Impact of temperature and biomass augmentation on biosulfur-driven autotrophic denitrification in membrane bioreactors treating real nitrate-contaminated groundwater"**, the authors including our faculty member Prof.Dr. Erkan ŞAHİNKAYA noted that Nitrate (NO_3^-) contamination of groundwater is a major health concern worldwide as it can lead to serious illnesses such as methemoglobinemia and cancer. Autotrophic denitrification is a smart approach for treating groundwater, being typically organic-deficient. Lately, biogenic sulfur (S0bio) has emerged as a sustainable, free, and high-efficiency substrate to fuel membrane bioreactors (MBRs) treating contaminated groundwater. However, the effects of moderate temperature and biomass concentration on the performance and fouling of the S0bio-fed MBR were not investigated previously. The researchers investigated the impact of biomass augmentation and temperature on autotrophic denitrification in S0bio-fed MBBR and found that bioaugmentation can be an effective strategy to increase denitrification efficiency but this may increase the biofouling in MBRs fueled with S0bio.

In the study **"Pre-concentration of Municipal Wastewater Using Flocculation-Assisted Direct Ceramic Microfiltration Process:Optimization of Operational Conditions"**, the authors including our faculty member Prof.Dr. Erkan ŞAHİNKAYA argued that due to the scarcity and depletion of natural resources, wastewater should be considered as a renewable resource, from which water, organic matter (OM),and nutrients can be recovered. Conversion of OM in wastewater to methane, hydrogen, and VFAs under anaerobic conditions is an alternative process for energy recovery. However, OM in the wastewater should be pre-concentrated to make the anaerobic treatment a more efficient and energy-positive process. Direct ceramic microfiltration (DCMF) is an effective technology to pre-concentrate organic matter (OM) for the subsequent anaerobic energy-recovering processes and a fast, cost-effective, easy treatment process for municipal wastewater. The major problem in DCMF is the rapid fouling of the membrane. In this study, to maximize OM recovery rates and prevent membrane fouling, the DCMF process was alternately paired with dosing of a cationic polyacrylamide (PAM) flocculant and chemically enhanced primary sedimentation (CEPS).