



Universitas Indonesia (UI) menyadari pentingnya ketersediaan air bagi bumi yang berkelanjutan, terutama untuk masa depan. Oleh sebab itu, dalam setiap penyelenggaraan aktivitas di lingkungan kampus, UI melakukan pengelolaan air melalui pemanfaatan teknologi dan pendekatan sosial.

Universitas Indonesia (UI) realizes the importance of water supply toward a sustainable Earth for future generations. Therefore, in every campus activity, UI always strives to control water management using technology and social approaches.

Pemenuhan Kebutuhan Air Bersih

Fulfillment of Clean Water Supply

Untuk memenuhi kebutuhan air bersih di lingkungan kampus, UI bekerja sama dengan Perusahaan Daerah Air Minum (PDAM) Kota Depok. Di bawah ini adalah tabel konsumsi penggunaan air bersih dari PDAM Kota Depok sepanjang tahun 2021.

UI has collaborated with the State-Owned Water Utility Company (PDAM) of Depok City to provide the water supply on campus. The monthly volume of water consumption from PDAM of Depok City during 2021 can be seen in the table below.

Tabel Penggunaan Air PDAM Tahun 2022
Table of PDAM Water Consumption in 2022

No	Bulan	Month	Volume (m ³)
1	Januari	January	13.194
2	Februari	February	15.441
3	Maret	March	10.257
4	April	April	9.223
5	Mei	May	10.284
6	Juni	June	9.434
7	Juli	July	9.994
8	Agustus	August	5.378
9	September	September	6.879
10	Oktober	October	8.075
11	November	November	10.469
12	Desember	December	13.242
Total			121.870

Guna menjamin ketersediaan air bersih, UI memantau intensitas penggunaan air setiap bulan dan memeriksa kadar sumber air bersih di area kampus setiap enam bulan sekali. Hasil pemantauan ini kemudian disampaikan kepada Pemerintah Kota Depok melalui Laporan Dokumen Evaluasi Lingkungan Hidup (Rencana Pengelolaan Lingkungan Hidup-Upaya Pemantauan Lingkungan Hidup/RKL-UPL) Kampus UI.

Seiring peningkatan populasi dalam kampus, maka untuk memenuhi kebutuhan air bersih, UI menerapkan kebijakan penghematan penggunaan air dan pengelolaan daur ulang air limbah untuk dapat digunakan kembali.

Program Daur Ulang Air

Water Recycling Program

Air daur ulang menjadi salah satu sumber air yang digunakan di UI. Sebagian besar unit dan fakultas di UI telah memiliki fasilitas Water Treatment Plant yang mampu mengolah air bekas pakai maupun limbah cair. Air daur ulang berasal dari limbah wudu, cuci piring di kantin, cuci tangan di wastafel, dan laboratorium, yang dapat digunakan untuk penyiraman tanaman dan toilet.

To ensure the water supply on campus, UI performs regular inspection and monitoring of water consumption every month and water content level every six months. The result of this monitoring will be submitted to the Depok City Government under the Environmental Review Document (Environmental Management Plan-Environmental Monitoring Initiatives/RKL-UPL) of UI Campus.

As the campus population increases, UI has implemented water-saving practices and wastewater recycling systems to ensure the water supply remains sustainable.

UI uses recycled water as one of their sources of water supplies. Nearly all work units and faculties also have owned a Water Treatment Plant facility to process used water and liquid waste. The recycled water comes from ablution water, dishwater, handwashing water, and laboratories.

Salah satu contoh pemanfaatan air limbah adalah dengan mendaur ulang menggunakan *Sewage Treatment Plant* (STP) domestik. STP merupakan instalasi pengolahan limbah cair yang umumnya ditujukan untuk limbah domestik, seperti air limbah dan air cucian yang mungkin mengandung komponen berbahaya bagi lingkungan. Air daur ulang akan dialirkan ke sumur resapan, sehingga dapat digunakan sebagai sumber air cadangan. Dengan memanfaatkan teknologi terkini, sistem yang dimiliki STP dapat mengolah limbah cair menjadi air jernih, sehingga tidak berbahaya bagi lingkungan.

Air daur ulang akan digunakan sebagai cadangan air di masing-masing fakultas guna mengurangi penggunaan air bersih yang bersumber dari PDAM maupun air tanah.

Beberapa fasilitas dan fakultas yang telah memiliki fasilitas pengolahan air daur ulang adalah Fakultas Hukum, Fakultas Keperawatan, Kantin Fakultas Ilmu Sosial Politik, Gedung I-Cell Fakultas Teknik, Gedung Ilmu Kesehatan (RIK), Fakultas Kedokteran, Gedung IMERI Fakultas Kedokteran, RSKGM Fakultas Kedokteran Gigi, Fakultas Kedokteran Gigi, Fakultas Ilmu Sains, Fakultas Ekonomi dan Bisnis, Fakultas Ilmu Sosial dan Budaya, Fakultas MIPA, dan Fakultas Ilmu Komputer, Gedung Pusgiwa, dan Fakultas Kesehatan Masyarakat.

Penghematan Penggunaan Air Water-Saving Consumption

Langkah penting lainnya adalah menggunakan air secara efisien. Untuk mewujudkan hal ini, UI telah melakukan kampanye atau sosialisasi mengenai pentingnya penghematan air serta menggunakan peralatan-peralatan yang mampu menghemat air.

Penggunaan Peralatan Hemat Air

Sebagai wujud gerakan hemat air, UI memasang dan memperbaiki peralatan air, seperti keran dan toilet menjadi ramah dan hemat air. Penggunaan peralatan ini menjadi standar untuk pembangunan dan renovasi gedung baru.

One way to take advantage of wastewater is to recycle it into clean water using a domestic Sewage Treatment Plant (STP). STP works like a liquid waste installation for household waste, such as wastewater from laundry activities that may contain harmful environmental ingredients. The recycled water will be put into infiltration wells for later use as reserve water sources. STP system applies the latest technology to convert wastewater into clean water that is harmless to the environment.

The recycled water will be reused as water reserves in each faculty to reduce the water consumption from PDAM and groundwater resources.

Some work units and faculties that already have a water treatment plant facility are the Faculty of Law, Faculty of Nursing, Faculty of Social and Political Sciences' Canteen, I-Cell Building at the Faculty of Engineering, Health Science Building (RIK), Faculty of Medicine, IMERI Building at the Faculty of Medicine, RSKGM of Faculty of Dentistry, Faculty of Economics and Business, Faculty of Mathematics and Natural Sciences (MIPA), Faculty of Humanities, Faculty of Computer Science, Pusgiwa Building, and Faculty of Public Health.

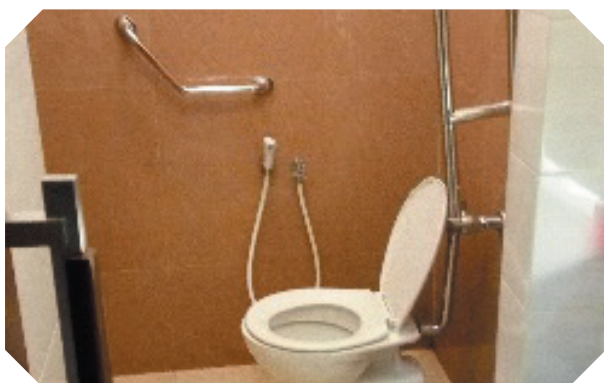
Another significant action is to use water efficiently. To make it happen, UI has organized a campaign or outreach event on the importance of saving water and using water-saving devices.

Using Water-Saving Devices

As part of the water-saving campaign, UI has been installing and upgrading water appliances with water-efficient technology, among others, on taps and toilets. Using these devices has become a standard in constructing and renovating new buildings.

Contoh peralatan yang mampu menghemat konsumsi air bersih ialah penggunaan keran dengan sensor otomatis (yang telah diimplementasikan di hampir semua fakultas di UI), serta *urinoir flushing system* dan *autoflush toilet*. Di Fakultas Teknik, penghematan air juga dilakukan dengan menggunakan mesin cuci piring otomatis terpusat di area kantin mahasiswa.

Some water-saving devices installed at the campus area are sensor taps in nearly all faculties of UI, urinoirs with flushing systems, autoflush toilets, and an automatic dishwasher with a centralized control located at the student canteen of the Faculty of Engineering.



Autoflush toilet untuk difabel di Fakultas Teknik UI.
Autoflush toilet for disabled at the UI Faculty of Engineering.

Data Penggunaan Keran Air dengan Sistem Sensor dan Toilet Siram di Gedung Kampus UI
Availability of Sensor Taps and Flush Toilets at UI Campus

No	Faculty/School	Water Taps with Sensor System	Highly Efficient Flush Toilets	Automatic Dishwashers
1	Faculty of Medicine (FK)	✓	✓	✗
2	Faculty of Dentistry (FKG)	✓	✓	✗
3	Faculty of Mathematic and Natural Sciences (FMIPA)	✓	✓	✗
4	Faculty of Engineering (FT)	✓	✓	✓
5	Faculty of Law (FH)	✓	✓	✗
6	Faculty of Economics and Business (FEB)	✓	✓	✗
7	Faculty of Psychology	✓	✓	✗
8	Faculty of Humanities (FIB)	✓	✓	✗
9	Faculty of Social and Political Sciences (FISIP)	✓	✓	✓
10	Faculty of Public Health (FKM)	✓	✓	✗
11	Faculty of Computer Science (Fasilkom)	✓	✓	✗
12	School of Environmental Studies-School for Global and Strategic Studies (SIL-SKSG)	✓	✓	✗
13	Vocational Program	✓	✓	✗
14	Faculty of Pharmacy	✓	✓	✗
15	Faculty of Nursing (FIK)	✓	✓	✗
16	Faculty of Administrative Science (FIA)	✓	✓	✗

Selain di setiap fakultas, UI juga mengaplikasikan peralatan hemat air bersih pada sejumlah fasilitas publik di area lingkungan kampus.

UI has installed water-saving devices, not only in each faculty but also in some public facilities located inside the campus.

No	Building under the Management of PAU	Water Taps with Sensor System	Highly Efficient Flush Toilets
1	Administrative Center (PAU) Depok Building	✓	✓
2	Library Building	✓	✓
3	Student Dormitory Building	✓	✓
4	Balairung Building	✓	✓
5	Integrated Laboratory & Research Center (ILRC) Building	✓	✓
6	Science Park Building	✓	✓
7	Student Activity Center (Pusgiwa) Building	✓	✓
8	Mosque of Universitas Indonesia	✓	✓
9	Convention Center Building	✓	✓
10	Makara Art Center Building	✓	✓
11	Satellite Clinic Building	✓	✓
12	Stadium of Universitas Indonesia	✓	✓
13	PPMT Building	✓	✓
14	UI Gymnasium	✓	✓
15	Salemba Rectorate Building	✓	✓
16	ARH Mosque of UI Salemba	✓	✓
17	Dormitory of UI Serpong	x	✓

Penyediaan Air Minum Gratis

Free Drinking Water Supply

UI menyediakan layanan air minum gratis kepada sivitas akademika melalui *water fountain*. Fasilitas ini tersedia di hampir semua fakultas, asrama mahasiswa, Gedung Pusat Kegiatan Mahasiswa (Pusgiwa), dan Masjid UI.

UI provides free drinking water to its academic community by setting up water fountain units. It has been available in nearly all faculties, student dormitories, Student Activity Center (Pusgiwa) Building, and UI Mosque.

Program Konservasi Air Bersih

Water Conservation Program

Sepanjang tahun 2021, UI konsisten melakukan pengembangan dan inovasi terkait upaya pemanfaatan air bersih di lingkungan kampus agar tetap terjaga dan berkelanjutan.

Throughout 2021, UI has consistently enhanced its development and innovation initiatives on water conservation at the campus to preserve and sustain the resources.

Program Pemanfaatan Air Danau

UI dikelilingi oleh enam danau buatan, yaitu: Kenanga, Agathis, Mahoni, Puspa, Ulin, dan Salam. Melalui kebijakan serta inisiatif pemanfaatan air di lingkungan UI, maka air dari danau-danau tersebut digunakan untuk menyiram tanaman dan kebun di sekitar lingkungan kampus. Misalnya, Danau Kenanga yang dimanfaatkan untuk menyiram tanaman di atap hijau gedung Perpustakaan UI. Sejumlah fakultas juga telah menggunakan air danau untuk memenuhi kebutuhan sehari-hari.

Program Lubang Biopori

UI selalu menempatkan lubang biopori sebagai resapan di hampir setiap lahan terbuka di area kampus. Lubang biopori merupakan teknik resapan air buatan yang dapat diaplikasikan pada lahan perairan dangkal. Lubang biopori memiliki banyak manfaat bagi ekologi dan lingkungan, seperti memperluas area resapan air, mampu menangani sampah organik, meningkatkan kesehatan tanah, dan berguna untuk arsitektur lanskap sebagai pelengkap *home gardening*, konsep *greenhouse* dan ruang terbuka hijau, serta *urban farming*.

Program Peresapan Air Hujan

Peresapan air hujan atau *rainwater harvesting* merupakan teknologi yang mengumpulkan, menyimpan, serta mendistribusikan air hujan untuk aktivitas sehari-hari. UI telah memanfaatkan air hujan yang diolah melalui berbagai filtrasi air bersih, sehingga dapat digunakan untuk menyiram tanaman, mencuci piring, dan kebutuhan air di toilet.

Sumur Infiltrasi

UI menempatkan sejumlah titik sumur resapan di lingkungan kampus. Sumur resapan merupakan teknik rekayasa konservasi air yang dibuat sebagai tempat penampungan air hujan agar lebih cepat terserap ke dalam tanah.

Ground Water Tank (GWT)

Tangki air tanah merupakan konstruksi bawah tanah yang berfungsi untuk menampung dan mengolah air bersih dari sumur dalam. Air olahan tersebut dapat dikonsumsi kebutuhan sehari-hari.

Lake Water Utilization

UI campus area is surrounded by six artificial lakes: Kenanga, Agathis, Mahoni, Puspa, Ulin, and Salam. Under some policies and initiatives of water conservation, the lake water can be used for watering plants and gardens around the campus. For example, water in Lake Kenanga is often used for watering plants of the UI Library Building's Green Roof. Some faculties of UI have also implemented a similar initiative.

Biopore Infiltration Holes

UI makes biopore infiltration holes in almost every open space available on campus. It is an artificial water absorption method that can be applied in shallow-water areas. It has many benefits for the ecological system and the environment, such as expanding water catchment areas, handling organic waste, and enhancing soil fertility. It is also useful for landscape architecture, particularly in home gardening, greenhouse and green open space concepts, and urban farming.

Rainwater Harvesting

Rainwater harvesting is a technology used to collect, store, and distribute rainwater for later use in daily activities. After processing it through multiple water filtrations, UI has used rainwater for regular consumption, such as watering plants, washing dishes, and flushing toilets.

Infiltration Well

UI has placed some infiltration wells around the campus area. This water conservation solution applies engineering principles in providing catchment areas for rainwater to penetrate the ground quickly.

Ground Water Tank (GWT)

Ground water tank is an underground construction for collecting and processing the water of a deep well. The treated water can be used for daily needs.



Pembuatan lubang biopori di area kampus.
Making biopore infiltration holes on campus.

Kolaborasi Ketahanan Air

Collaboration on Water Security

Citarum River's Water Drinkable by 2025

Sebagai wujud pengabdian dan kepedulian terhadap lingkungan dan masyarakat, Universitas Indonesia berkolaborasi dengan Monash University (Australia) dan Institut Pertanian Bogor (IPB, Indonesia) dalam Urban Water Research. Kolaborasi lintas disiplin tersebut dilakukan untuk melakukan riset bersama pada bidang politik, hukum, ekonomi, sosiologi, perencanaan kota, arsitektur, teknik sipil, ilmu tanah dan kehutanan.

Dipilihnya Sungai Citarum sebagai *project* kolaborasi adalah karena sungai ini telah mengalami pencemaran yang disebabkan dari limbah industri dan rumah tangga. Kegiatan penelitian yang telah dimulai sejak 2018 ini bertujuan untuk merevitalisasi aliran Sungai Citarum.

Penyediaan Fasilitas Pendukung Pencegahan dan Penyebaran Pandemi

Sejak pandemi melanda, UI secara aktif melakukan berbagai upaya pencegahan transmisi Covid-19 di kampus yang diimplementasikan melalui sejumlah kebijakan, inovasi, dan fasilitas pendukung yang bermanfaat bagi sivitas akademika UI dan masyarakat sekitar. Salah satunya adalah menyumbangkan alat cuci tangan keliling atau *moveable hand washers* (MHWs) ke rumah sakit, pasar, terminal, stasiun, dan tempat lainnya yang berada di wilayah Jabodetabek.

Citarum River's Water Drinkable by 2025

As a sense of dedication and care to the environment and community, UI has taken partnerships with Monash University (Australia) and Bogor Agricultural Institute (IPB, Indonesia) on Urban Water Research. The cross-disciplinary collaboration aimed to conduct joint research on politics, law, economics, sociology, urban planning, architecture, civil engineering, soil science, and forestry.

The Citarum River was selected as the project area because it had been polluted with industry and household waste. The research has been ongoing since 2018 to revitalize the Citarum watershed.

Providing Supporting Facilities to Prevent the Pandemic Spread

Since the pandemic began, UI has made various efforts to prevent the Covid-19 spread on campus. The initiatives were implemented in some policies, innovations, and supporting facilities that benefited the UI academic community and its surrounding society. One was donating moveable hand washers (MHWs) to hospitals, local markets, terminals, stations, and other places in Jabodetabek.



Alat cuci tangan keliling
Moveable hand washers

Tantangan, Solusi, dan Peluang atas Permasalahan Air

Pada 13 November 2021, Prof. Dr. Ir. Setyo Sarwanto Mursidik, D.E.A. dari Teknik Lingkungan, Fakultas Teknik UI menyampaikan pidato pengukuhan guru besar yang berjudul "Lintas Batas Sains Air Dan Tantangan Inovasi Teknologi".

Ia menjelaskan sejumlah tantangan terkait kebutuhan air saat ini, seperti pengelolaan air hujan dan adaptasi terhadap perubahan iklim, pemanfaatan energi baru terbarukan (EBT), efisiensi energi, dan perhatian terhadap emerging kontaminan. Ia pun menawarkan sejumlah inovasi untuk mengatasi permasalahan air dengan pendekatan multidisipliner, salah satunya rumah pintar dan pemanfaatan *internet of things* (IoT) dalam pencegahan bencana terkait air.



Ketua dan Anggota Senat Akademik Fakultas Teknik Universitas Indonesia.

Challenges, Solutions and Opportunities for Water Issues

On November 13, 2021, Prof. Dr. Ir. Setyo Sarwanto Mursidik, D.E.A. from Environmental Engineering, the UI Faculty of Engineering, delivered a professor inauguration speech titled "Crossing Water Boundaries and Technological Innovation Challenges".

He explained various issues related to current water needs, such as rainwater management and adaptation to climate change, utilization of new and renewable energy (EBT), energy efficiency, and attention to emerging contaminants. He also offered some innovations to overcome water problems with a multidisciplinary approach, such as implementing smart home system and the internet of things (IoT) to prevent water-related disasters.

Menurut Prof. Setyo, pendekatan multidisipliner dibutuhkan untuk pengelolaan air secara berkelanjutan.

According to Prof. Setyo, a multidisciplinary approach is needed for sustainable water management.