ISTANBUL GELISIM UNIVERSITY

Water Management Report

CONTENTS

1. INTRODUCTION

Water, which is an indispensable natural resource for life, has become a an increasingly important strategic resource in the world. Since the beginning of the 21st century, the increase in environmental problems has started to limit usable water resources. Rapid population growth also increases the demand for water, causing the problem to grow. Despite the decreasing usable water potential, the world population's need for more water day by day has increased national and global awareness on water resources. For this reason, water management and transboundary waters are at the top of the agenda of all countries (Evsahibioğlu 2008a, Evsahibioğlu 2008b).

One of the objectives of the "Millennium Goals" adopted at the UN 1998 Millennium Summit is to ensure environmental sustainability. In this context; Goal 9 is to “integrate sustainable development principles with country policies and programs and reverse the destruction of environmental resources”, and 10th Goal is “to halve the proportion of the population without access to safe drinking water and basic waste system by 2015”.

Today, approximately 300 million hectares of land are irrigated in the world. Irrigation has enabled the increase in agricultural production, the stabilization of food production and prices. However, the increase in population and income has increased the demand for irrigation water in order to meet the food production requirement. While improvements in irrigation have been dazzling, in many parts of the world, improper irrigation management practices have significantly lowered groundwater levels, destroyed soils, and reduced water quality. It is stated that in many countries where irrigation has an important place today, 6580% of the total water used is used for irrigation. Agriculture and livestock activities are among the activities that consume the most water today. The agriculture and livestock sector not only plays an active role in water consumption, but is also one of the biggest polluters due to the plant nutrients and pesticides used.

In addition to the limited available water resources, the pollution of surface and groundwater also threatens the life of living things. Pollution of both surface and underground waters can affect each other and the soils irrigated with these waters. The movement of dirty surface water deep into the soil can affect the quality of groundwater, and contaminated groundwater can move towards streams and lakes, contaminating surface waters. Especially in places where domestic wastewater is used for irrigation without treatment, pollutants can pass into the soil and groundwater and ultimately affect human and animal health. (Cakmak and Ark, 2008).

It has been determined that the amount of surface and ground water that can be consumed technically and economically for various purposes in our country is 112 billion m^3. In order for a country to be considered water rich, it must have an average of 10000 m^3 water potential per person per year. Countries with a water potential of less than 1000 m^3 are considered "Water Poor". When the population in Turkey is considered as 80 million, the amount of usable water per capita is 1400 m^3/year. Although this value is not water poor, it shows that Turkey is among the countries with water restrictions.

1.1 Scope of the Plan

Within the scope of quality management, Istanbul Gelisim University has been adopted and supported by all stakeholders whose responsibilities and positions have been determined in the relevant regulations, and has created awareness by announcing its quality management policy throughout the institution. Established with the aim of realizing the Quality Management System, Istanbul Gelisim University Quality Commission makes its own internal evaluation in order to achieve the corporate performance targets determined in line with the institutional strategies of the university, determines the necessary improvements, and adopts a participatory and transparent approach while carrying out these studies.

There are 8 building/building blocks belonging to Istanbul Gelişim University and this plan covers the improvement works to be done in all our buildings in 2020, based on 2019 data. Our building information is stated in Table 1.

Campus Name	Building Name	Close Area (m2)	Year of Construction	Type of Use Before Being an Educational Institution
A BLOCK	RECTORATE	39114	1997	Establishment
B BLOCK	Sport Sciences College	11755	1996	Establishment
C BLOCK	Health Services College	10445	1996	Establishment
D BLOCK	Faculty of Engineering and Architectural	12353	1991	Establishment
E BLOCK	Faculty of Fine Arts	9836	1991	Establishment
F BLOCK	The School of Foreign Languages	8285	1995	Establishment
G BLOCK	Vocational School	29536	1998	Establishment
TOWER		91054	1999	Establishment

Chart 1: Construction Details

2. ASSESSMENT OF WATER USAGE

2.1 Water Consumption

The water consumption data were obtained from the January 2020-December 2020 period to prepare the water consumption plan 2020 for Istanbul Gelisim University. This period shows water consumption data for 2020. By evaluating these data, some decisions have been taken on water consumption and conservation for 2020. The aim for 2021 is to reduce overconsumption and stay proportionally below 2020 ratios' which derived from the total water consumption/total number of users.

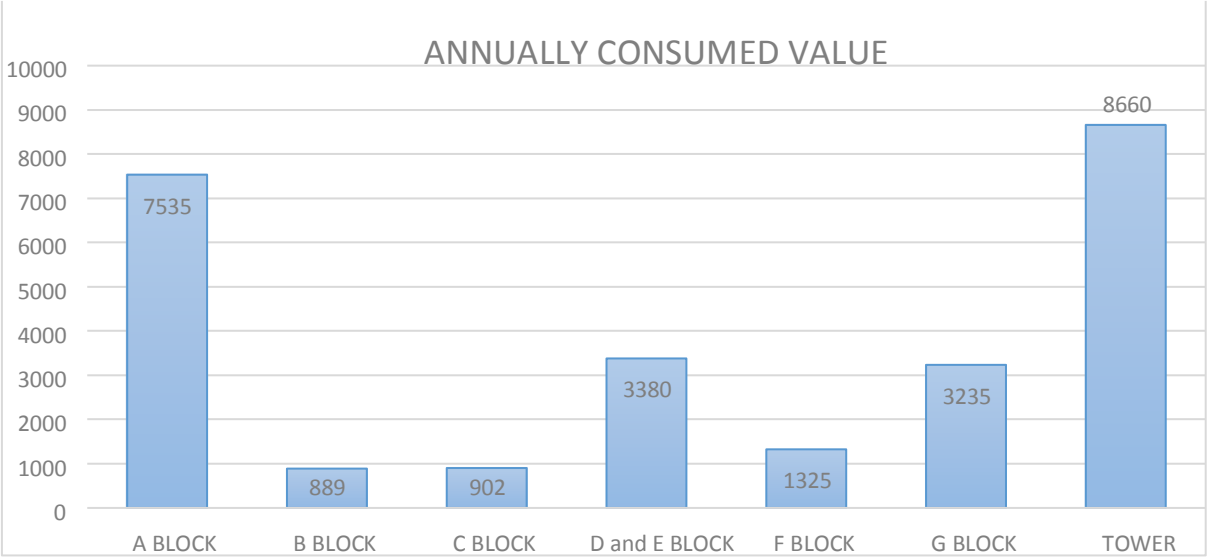

Chart 2: Consumption Data for 2020

The water consumption amount of our university, which consists of 8 building/building blocks on 297.381 m2, is 36.045 m3 in 2018.

The total amount of clean water consumption in 2019 is 39,767 $m3$.

The total clean water consumption amount for 2020 is 26,088.1 $m3$. Due to the pandemic, which increased its impact in the beginning of 2020, this consumption decreased compared to 2019 with the distance education applications.

There are a total of 150 water dispensers in common areas and offices, and the water consumption is 162.1 $m3$. This consumption is shown in Table 3 on the basis of structure. Since it contains the majority of the administrative units in the A block, it has the most proportional use.

Chart 3: Consumption Data for 2020

As a result, total water consumption indicators for 2020 decreased compared to 2019. However, in order for the evaluation to give a healthy result, the water consumption rate (total water consumption / total number of users) should be evaluated. Within the scope of our university, there are 28,908 students and 2,000 administrative and academic staff in 2020. In the evaluation made with these figures, the water consumption rate (total water consumption / total number of users) was 1,836 $m3$ per person in 2018; It reached a value of 1,545 $m3$ in 2019 and 0.844 $m3$ in 2020.

2.2. Importance of Water Consumption Analysis

To achieve accurate results, values should be examined on the basis of building and person. For example, as shown in Table 2, the consumption of our tower campus is more than Block A. However, in the examination of the consumption value perm m2, we see a greater value of consumption in Block A (in Table 4). It is more because of the fact that Block A is an administrative building, contains many offices, almost all of the building is used during the day and there is a lot of human circulation.

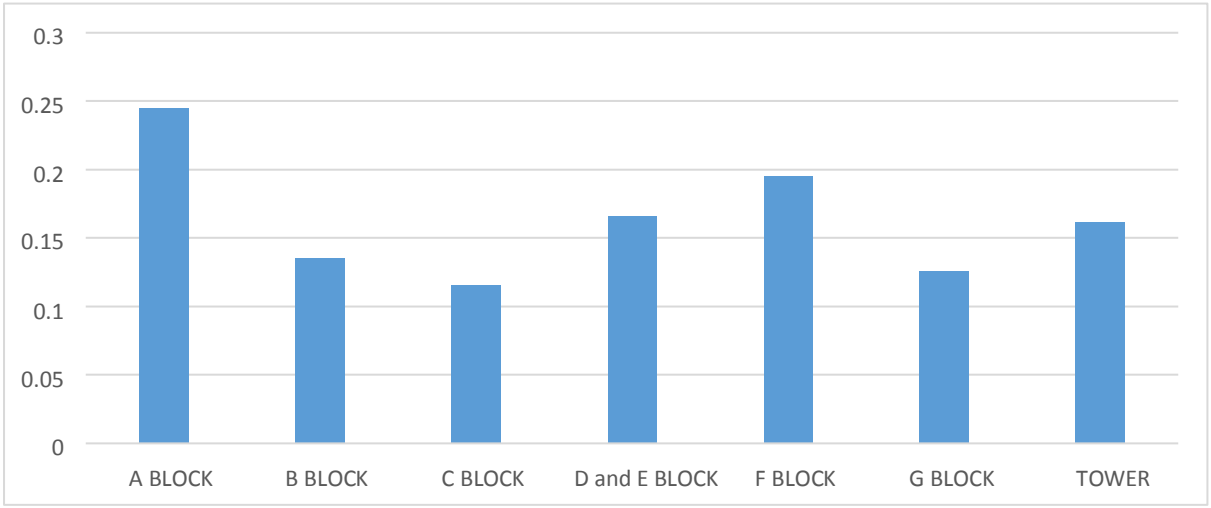

Chart 4: Consumption Values for $1m^2$

3. CONSUMPTION DATA

The clean water consume was calculated based on paid water bills and well water bills in our university.

In 202, there was 26.088 m3 of water consumption. 4,000 m3 of this consumption was obtained from water stored in wells. The well water used for the green areas in the tower was supplied by intermediary firms.

In 2020, our university has 520 faucets that meet the daily water consumption requirement. 260 of these are sensor faucets. Data for 2019 shows that there are a total of 483 faucets and 220 of them have sensors. In 2018 data, it is seen that there are a total of 450 batteries and 110 of them have sensors.

Water use for green space at our university:

• It has 2350 $m2$ green area in the tower campus. Irrigation is done with well water and water meters are separate. An annual consumption of 4000 $m3$ well water has been in this area.
• The green area of the 4th floor in the tower building is 62 $m2$ and irrigation is provided from drinking water.
• There is 3200 $m2$ green area in A block. The irrigation system is supplied from drinking water.
• There are 30 $m2$ green areas in B block. The irrigation system is supplied from drinking water.
• There is 80 $m2$ green area in C block. The irrigation system is supplied from drinking water.
• There are 70 $m2$ green areas in D block. A large part of the irrigation system is provided by the storage and use of rainwater.
• There is 120 $m2$ green area in E block. A large part of the irrigation system is provided by the storage and use of rainwater.
• There are 20 $m2$ green areas in F block. The irrigation system is supplied from drinking water.
• There is 1200 $m2$ green area in G block. The irrigation system is supplied from drinking water.

4. PRACTICES TO IMPROVE WATER EFFICIENCY

4.1. What is water efficiency?

Water efficiency is the ability to do the same amount of work using less water, without reducing the standard of living, production quality and quantity, with the use of new technologies. In other words, water efficiency is to reduce water consumption per unit of service or product.

In this context, there are two areas with water efficiency potential at our university:

- Waste water
- Clean water

Water Management Plan

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IGU reports regularly to ensure water efficiency and takes various measures to reduce water consumption. In this context,

Measuring water consumption

Increasing usage efficiency

Reducing leaks

Incorporating water-saving designs in new and converted buildings

Transformation of rain water is provided.

Key Activities

Water costs and consumption should be shared by the university with other stakeholders.

Leaks in the university infrastructure must be identified and urgently fixed.

It is to include designs that will save water in new and converted buildings.

Routine intake of bottled water should be avoided.

Water use is directly related to climate change mitigation. A significant amount of energy is used in the supply and purification of water. He estimates the carbon costs of the water supply at around 0.271 grams of CO^2 per liter. Therefore, more efficient use of water in educational facilities can lead to a significant reduction in carbon footprints.

Water Usage in Restrooms

Double flush reservoirs should be preferred in restrooms. If there are old toilet bowls, they should be replaced with new ones. Rainwater should be channeled into reservoirs and water consumption should be reduced.

Toilet flushes account for approximately 25-30% of total water use. To reduce the consumption here, double flush system and low flush toilets should be used.

Water Use in Urinals

Photocell reservoirs should be used in urinals.

Valves

Valves should have photocells. In this context, our university uses fully photocell valves in its new WCs and replaces its old valves with photocell valves in line with the budget within the scope of transformation. Shower heads with high water efficiency shower heads; Valves in showers and valves should be replaced with thermostatic mixing valves. In order to prevent unnecessary and long use, the use of flow rate and photocell batteries and taps was accelerated in 2019 and continues in 2020 at an accelerated pace.

By 2021, it is planned to increase this number to correspond to half of the current usage, and to replace and maintain filters and aerators for faucets, valves, etc.

In addition, decisions were taken for the design of the drip system for landscape irrigation and the efficient use and storage of rainwater.

5. STANDARDS TO BE APPLIED IN EXISTING AND NEW CAMPUSES OF THE UNIVERSITY

Attention will be paid to water efficiency in our new and converted buildings. Efforts will be made to construct environmentally friendly and green buildings with high water efficiency. Although many of these terms are terms that have recently started to be used especially in Turkey, this purpose cannot be achieved because they are ignored during construction. The way to prevent this situation can be achieved by making the right planning, increasing the sensitivity to the subject and not making any concessions from this sensitivity during the construction. First of all, our standards must be determined and their implementation must not be compromised. These standards will increase the cost during the construction phase; but it will provide great convenience to the user and the environment during use. Our goal is to apply these standards in our new structures;

Applications of many austerity measures will be investigated and implemented at the planning stage.

In our new buildings, domestic and drinking water installations will be separated, thus reducing the costs of domestic water.

Waste water lines will be constructed in two separate lines as black and gray water lines, and sinks and showers will be connected to the gray water line. With gray water conversion systems, a much cheaper treatment will be provided and a great deal of savings will be achieved.

In installation materials, thermostatic batteries and valves suitable for automation will be preferred instead of manual products.

Infrastructure works will be carried out to collect and use rain water.

Environmentally friendly, green products will be preferred.

Dry production technologies, systems and processes that will consume less water or operate completely without water will be preferred in the facilities.

Attention will be paid to afforestation of the campus area.

Technologies (process optimization, waste recovery, renewable energy, etc.) that prevent pollution at its source and reduce resource consumption will be used.

Environmentally friendly products (Bioplastics, water-based paints) that pollute less and consume resources will be used.

Pollution management – end-of-pipe measures (Treatment, dust trap filter, waste storage, etc.) will be taken.

In cooling; Care will be taken to use closed-loop systems and cooling towers, to minimize and recover tower blowdowns.

In heating; improvement of steam systems, steam recovery, preference of heat exchangers, minimization of boiler blowdowns will be considered.

The automation rate in water systems and lines will be increased.

WATER MANAGEMENT POLICY

Istanbul Gelisim University is aware of the decreasing and depleting water resources day by day; has adopted the principle of raising awareness and consciousness in this regard; it has become a university that produces and demonstrates fundamental studies in this direction. In this context, the university took radical decisions on the use and sustainability of water resources and revealed the 'Istanbul Gelisim University Water Management Policy'

Basic values

Participation: It is an understanding of participation that is designed, conducted, evaluated and developed with the continuous participation of internal and external stakeholders.

Management with Stakeholders: Decisions concerning the University are taken with a participatory approach. This participation; academic and administrative staff, students, alumni, public and private sector employees, private and legal persons.

Openness and Transparency: The university announces its mission, vision, core values, goals and success indicators in an accessible way by the relevant units. Information and data sharing, transparency and accountability are essential.

Continuous Improvement: Continuous improvement of the physical, social, digital and psychological environment of the University in the context of quality philosophy and policy is the common responsibility of all stakeholders.

Sustainability: All stakeholders adopt ecological, economic and social sustainability as a priority target.

Creating Value: Research and development activities are carried out to add value to nature, ecology, science, technology, society, humanity.

Universality and actuality: Absorbs universal values and scientific knowledge; It melts current issues and studies related to the subject within its body.

The university is a whole with its environment (Universalism): The university exists within its social, economic and ecological environment. The goodness, quality and sustainability of the environment directly affect the university.

University serves humanity (Utilitarianism): The university is a structure founded on universal values and purposes, and it tries to contribute to humanity and the quality of life with its activities.

The cornerstones of the water management policy shaped around these values and priorities are:

The content of water management is evaluated and decided by regular and systematic feedback from internal and external stakeholders. Stakeholders are informed about the decisions taken.

Collaboration of stakeholders in education, research, community service and university management; It is essential that they make a constructive and value-added contribution and work with this understanding and in good faith.

The university specifies the scope of its water management strategy by relating it to its immediate and distant surroundings, with priority on campus areas.

In this context, the importance of even a drop of water is known and works for the sustainability, ergonomic and reuse of water, which is a limited resource.

It provides technical infrastructure in university campus areas and supports studies for the development of technical knowledge.

The university carries out the necessary academic activities, organizes various trainings and seminars to raise awareness.

In order to contribute to the development of water policies based on scientific knowledge on a national and global scale, it offers suggestions on water issues in our country and in the world.

WORKS FOR WATER RECOVERY

DEVELOPED STANDARDS FOR MEASURING WATER REUSE

Water clarity: Whether there is an abnormality in the color of the water,

Smell: Whether there is algae or foreign smell in the water,

Color: If there is an abnormality in the color of the water,

pH value: By evaluating whether the pH value of the water is in the appropriate range, it is decided to reuse the water.

RAIN WATER RECOVERY

Our university has developed a number of projects for the recycling of water. These projects were mainly developed for the recovery of rain water. Within the scope of the project, rainwater is directed to the warehouses through gutters, stored and used for garden irrigation. This method plays an important role in the irrigation of our ever-increasing green spaces.

USING THIRST RESISTANT PLANT

The use of green space in our university is increasing every year. In this context, care is taken to use plants with low water consumption.

6. CONCLUSION

First of all, the water manager should be determined by the University administration and water consumption should be monitored at certain periods. The use of water resources should be planned and a regular monitoring network should be established to bring the best level of water efficiency. It is planned to prevent both overpaid bills and unconsciously used water with the cost calculation after the replacement by calculating the existing costs and the replacement cost. Factors such as climate change, misuse of soil and water resources are increasingly limiting usable water and soil resources. As our university, we are working to provide the necessary priority for water efficiency.

7. REFERENCES

Anonymous 2007. Water for Food Water for Life. A Comprehensive Assessment of Water Management in Agriculture.

Turkey national energy efficiency action plan,2020, T.R. MINISTRY OF ENERGY AND NATURAL RESOURCES

David Molden, International Water Management Institute.645p., Earthscan, USA.

Anonymous 2009. DSİ'ce İşletilen ve Devredilen Sulama Tesisleri 2008 Yılı Değerlendirme Raporu. DSİ Gn. Md., İşletme ve Bakım Dairesi Başkanlığı, Ankara.

İçme Suyu Temin ve Dağıtım Sistemlerindeki Su Kayıplarının Kontrolü El Kitabı; https://www.tarimorman.gov.tr/SYGM/Link/13/Su-Verimliligi