



THE GLOBAL GOALS
For Sustainable Development



ISTANBUL **GELISIM** UNIVERSITY

MANUAL FOR LESS WATER USE

CLEAR WATER AND SANITATION



Istanbul **Gelisim** University
COMMUNITY SERVICE
Unit

www.gelisim.edu.tr

Water is Life,
Don't let it run down



INTRODUCTION

It is indicated that only 2,6% of water reserve of the world is fresh water. Also, very large part of it is in glaciers forms in polar regions. Very few parts of fresh water is in steam form in atmosphere and in surface and underground water forms on earth's crust. It is stated that water consumption increased 6 times in 20. century depending on increasing population in the world. It is mentioned that water consumption amount was 16.800 cubic meters per person in 1950 and it decreased to 7.300 cubic meters in 2000. It is estimated that water consumption per person will decrease to 4.800 cubic meters in 2025 when it is expected that population of the world will reach 8 billion. It is stated that the tension between countries in many regions has already increased regarding water use. It is indicated that the number of waterless countries is gradually increasing based on global warming in a wide area from USA to Middle East and to South Asia. The experts warn that water crisis can cause possible "water fights".

Various sources mention that total water potential of our country is 501 billion m³/year. It is stated that the part of that amount passing to direct flow is 166 billion m³/year, 67% of remained water disappears with leaking, vaporizing and transpiration, that our total depth of our streams is 186.1 billion m³/year level in average for a year with contribution of water leaking to underground, that collection in dams and ponds is approximately 91.1 billion m³/year, total 111 billion m³/year water consisting streams, ponds and underground waters has available water supply potential.

Water conveyed by Aegean- Mediterranean- Central Anatolia- Southeast Anatolia, has extreme decreasing trend in a long term. Currents in North Aegean- South Marmara- Central Mediterranean- North sections of Central and Southeast have decrease 2 trend in addition that it is not extreme. Decreasing trend is faster in locations where industrialization and urbanization are intense and where agriculture is dominant. In 1999-2000 period, arid conditions were intense in East, Southeast, Central and Aegean Regions. Underground waters are rapidly decreasing. Surface water supplies cannot be fed, being contaminated rapidly. 93% of watering is in surface watering form and watering is performed with methods in which excessive water is consumed by not taking "water economy" into consideration. Modern-audited watering methods ensuring water saving and watering efficiency, could not be generalized sufficiently. All types of information is needed for how to collect every drop of water falling on the earth and how to have benefit from that water.

"Saving is the best water supply". With reference to that saying, mainly local administrations and citizens have important missions in informing and applying water saving. There are various applications to be performed in line with the decisions taken by administrations regarding water saving, points to pay attention by ensuring awareness of citizens. By taking all these into consideration, this manual has been written with the purpose of ensuring awareness by indicating many titles those should be made by the institutions and those should be paid attention by citizens.

We can array saving titles such as:



1. ACTIONS THAT SHOULD BE TAKEN BY MUNICIPALITIES

Municipalities should perform works regarding water supply, safety and saving and should establish a water balance sheet.

Municipalities should establish consultation centers and web pages about how to use water efficiently (less) in homes and workplaces. They should make warnings and suggestions for consumers about things to pay attention while purchasing faucet, shower head and toilet tank. It is required to demonstrate how to determine water leakages at homes.

Water saving toilet tanks, faucets and shower heads should be used in Municipalities, Housing Development Administration, Construction Works General Directorate and construction companies and recently constructed buildings.

While water consumption was 250 l/person/day in developed countries in 20 years ago, it was decreased to 130 l/person/day by using water saving technologic equipment. In EU countries located on Danube basin, water consumption has been decreased in recent years and it is between 100-150 l/person/day in member states not, it is below 100 l/person/day in Slovakia, Czechia and Hungary.

Developed countries took protection method without using as basis. Water pricing should be gradual and reasonable for water consumption on and below 130 l/day per person for homes and work places.

Pricing water fairly and equally is important for sustaining and expanding the system and to keep water clean. Drinking water and waste water tariffs are determined to meet appropriate treatment of fresh water, transmission, distribution and then collecting waste water, removing, treating and discharging services. However, water tariffs for homes and work places consuming more than 130 liters daily per person, should be increased gradually. Water tariff applications should be placed for citizens to prevent waste of water. Collection should be made gradually for the ones consuming water above average.

When water is used efficiently (saving), water bill will be less. Thus, there will be less energy consumption by water pumps, water flow entering into water treatment facility will decrease and treatment facility operation cost will decrease.

Using pressurized watering in parks being built at cities should be put into practice. Pressurized watering systems should be established on green areas in cities. Disorderly watering should be ended in cities. Watering in afforestation works in cities should also be made with pressurized watering system. For watering parks and gardens, morning and towards evening hours should be preferred when vaporization is less.



Unlicensed wells should be closed. Municipalities and State Hydraulic Works should establish separate department for this work. No one has right to use underground water randomly. No one should open wells without having permit from Municipalities and State Hydraulic Works. Underground water is a very valuable and clean water supply. It should be used in a balanced and in accordance with its technic. Municipalities should establish a separate department to monitor leakages/losses in networks and to take required measures. Leakages and losses in drinking water network causes to waste fresh water supplies, to consume water excessively and uncontrolled and to increase operation costs.

Local administrations should establish a free consultation line for water saving within the frame of "Institutional Social Responsibility Policy".

The more water consumption per person decreases in housings and work places, the more there will be need for increasing capacities of water and sewage systems and thus substructure investments are minimized. Thus, there will be no need to increase capacities of drinking water and sewage system based on increase in population and the pressure on drinking water supplies are minimized.

Municipalities should determine housings and work places where water consumption is intense and should exhibit road maps and measures to take for decreasing water consumption in those regions.

2. ACTIONS THAT SHOULD BE TAKEN AT HOMES AND WORKPLACES

Water should be used at homes in rates such as; 35% at bathroom, 30% at toilet, 20% for laundry and dish washing, 10% for cooking and drinking and 5% for cleaning. If a faucet or a tank leaks a drop in a second in homes or work places, it makes at least 12.500 liters water in a year. Leaking faucets and tanks should be repaired.

Water consumption can be decreased 25% by using faucets that can easily be opened and closed, with aerator and with low flow instead of classic faucets. You can read water meter before and after you do not use water and check water leakages.

2.1. WATER CONSUMPTION IN TOILETS AND BATHROOMS

Do you know how much water you consume on a daily basis at your home and your workplace (m³/month)? In order to stop wasting water in your home and reduce water bills, you must first learn how much water you consume. Read your water meter at the beginning and end of a month. The difference indicates the amount of water you consume in that month. You can also determine the amount of water you consume from water bills.



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One out of
every 10 people
in the world cannot reach
**CLEAN WATER
RESOURCES**



In many homes or work places, there might be a latent water leakage. To determine this, close all taps and read your water meter. Do not use water for two hours. At the end of that two-hour period, read your water meter again. Or read your water meter before you travel and read it again when you come back home. Thus, you can learn whether there is a latent water leakage. Since water amount consumed in homes, toilets and bathrooms consists of 70% of total water consumed in homes.

2.1.1. WATER CONSUMPTION IN TOILETS

Toilets, which occupy an important place among domestic water consumption, are areas where water consumption is high. In a study, it has been calculated that approximately 27-30% of water is consumed in toilets.

The simplest way to reduce water usage in a toilet is to reduce flush volume. Water storage capacity of a classic toilet tank is 16 liters. By considering that each person of a family consisting four members, uses toilet two times in a day, a toilet tank of 16 liters consumes 3.840 liters water in a month. The toilet tanks that waste water, should definitely be replaced. Instead, it is possible to clean toilet and to use a toilet tank of 4 liters and decrease water consumption to 960-1.200 liters, to save 34.560 liters water per year and decrease 10 water consumption 75% for toilets. In the reservoir systems to be used on toilet stones, that should be adjusted to flow 5 liters of water.

Briefly, the best to increase efficiency of reservoir is to use a new ultra-low flow gradual ones instead of an old and inefficient one.

When purchasing a new toilet reservoir for your home and workplace, make sure that there are models that consume a maximum of 4 liters of water in one flush. Besides, you can fill 0.5-1 liter pet bottles with water and put them in your reservoir and with this method, which is extremely easy to apply, you can reduce the amount of water consumed from the reservoir when you flush.

On the other hand, your toilet reservoir may leak. This amount can reach 700 liters daily. In order to control leakage, add a few drops of painted water inside your reservoir. If you see this color in your toilet within 5-7 minutes, it means that there is a leak. Repair / have your leaking reservoir be repaired.

2.1.2. WATER CONSUMPTION IN BATHROOMS

You can reduce 25% of water consumption by taking a shower instead of filling a bathtub when you bath. While consuming 40-60 liters of water by taking a shower, 120-150 liters of water will be consumed by bathing in a bathtub.

An average 4-5-minute shower is a great goal. Thus, you can save 55 liters of water per shower. Eco-shower heads technology that consumes less water should be developed and generalized.



If you can check hot water with a single opening-closing, do not keep water running when you soap your body or hair when you take a shower.

While classical shower heads consumes 15-20 liters water per minute, low flow aerator heads consumes 3.4-7.6 liters water per minute. Thus, instead of 90-120 liters of water during a 5-6-minute shower, it is possible to take the same bath with 45-60 liters of hot water. Thus, a family of 4 can save 55 tons of water per year if they shower 3 times a day.

You can reduce water consumption less than 10 liters by using low-flow aerator shower heads. Thus, you can ensure 30-40% water saving compared to normal shower head.

You can use water 25-35% more efficiently by using a low- flow aerator shower head for faucets in your bathroom and you can reduce use of hot water at that rate. Clean your aerators periodically. Particles may accumulate on the filter.

Pay attention to keep shower time in 5 minutes or less. If you want to take a bath in a bathtub instead of a shower, you can take a bath by reducing water level you will put in your bathtub by 2.5-5 cm. If you have to take a bath in a bathtub, firstly close your bathtub drain, then turn on faucet and fill your bathtub with water.

When you open hot water faucet in shower, you can prevent waste water in a considerable amount by collecting water running cold until it gets hot, in a bucket, also 13 you can pour that water on toilet or you can use it for cleaning or flower watering and you make saving.



2.1.3. TOOTHBRUSHING AND SHAVING

Tooth brushing takes 3 minutes in average. If you leave a faucet open, you waste 15 liters water in average per each toothbrushing. If you make toothbrushing twice a day, you will consume 10.950 liters of water in a year.

When you brush your teeth twice a day for 3 minutes without shutting off water for 1 year, you are wasting a family's 2-year kitchen water need. If you shake your toothbrush in a glass of water when you do toothbrushing, you make 9.100 liters water saving per year or by using a low-flow faucet with aerator which has 1.8-4.5 flow, you can reduce water consumption. Aerated low-flow armature technology should be developed and its use should be generalized. By keeping faucet turned off when you do toothbrushing, shaving and soaping your face, you can save 15-35 liters water per day.

You can rinse/clean your shaver or razor in a glass of water. Thus, you can save 11 liters of water per shaving. After toothbrushing, shaving and washing your hands, you can store gray water in a reservoir and use it to clean your toilet.

2.1.4. WATER CONSUMPTION IN KITCHENS

The amount of water consumed in the kitchen constitutes 10% of total water consumed in home.

While washing dishes, firstly remove rough dirt with a brush. Place mild/cold water in a washbowl and detergent, foam detergent and slowly turn on faucet and quickly wash dishes. Then place clean mild/cold water in the same washbowl and rinse cleaned dishes.

Do not rinse your containers with direct running city water. Thus, 30-60 liters of water is saved daily. Before washing your dishes by hand or in a dishwasher, soak them in a bowl of water and soften dirt.

Do not wash your dishes with running city water. With the help of water and detergent in a deep and wide bowl, after removing dirt from dishes, turn on your faucet slowly and whip and rinse.

While classical faucets that you use in kitchen, bathroom and toilets, consume 8-27 liters water per minute, low-flow aerator faucets consume 1.8-4.5 liters per minute. Thus, you can save 50 liters of water. It is possible to provide the same water flow with 16 the apparatus with aerators attached to faucets in kitchens, bathrooms and toilets. It has been determined that low-flow faucets with aerator consume 41 liters of water per person per day. It is required to promote, reward and develop this technological equipment.

By using low-flow armatures with sensors and aerators in workplaces such as hotels and motels, you can ensure waste of water and efficient use. Remember, customers sometimes forget faucets open and water runs down.

Prevent dripping water from faucets. Remember that 750-1500 liters of water is wasted per month from a faucet that runs 50-100 drops of water per minute. Make sure your faucets leaking water are repaired and do not run waste water. If companies dealing with repairing faucets are licensed by municipal water administrations, it is possible for water administrations to inspect them. Besides, it is required to generalize manufacturer's services.

Wash fruits and vegetables in a bowl of water instead of running city water. Pour water halfway into washbowl. After putting the vegetables and fruits in water, open your faucet slowly and wash quickly.

Instead of running city water as drinking water, use water in a water-bottle or placed in a refrigerator.



Hot water leaking from faucets means excessive water use and waste of energy. Absolutely make your faucets be repaired to prevent energy and water waste. Do not use water to defrost food that you take out of your freezer. You can defrost food you take out of your freezer by placing it in the lower compartment of your refrigerator overnight.

2.1.5. DISH WASHER AND WASHING MACHINE

Conventional washing machines and dishwashers consume 40 liters of water at a time in average. Operate your washing machine and dishwasher at full load. We can prefer short programs while operating a washing machine. You consume the same amount of water and electricity when you operate your washing machine and dishwasher at full or half load. Prevent wasting water and electricity. When purchasing washing machines and dishwashers, choose models that use water and energy efficiently. User water saving dish washer consuming 17 liters water.

3. CAR WASH

If possible, wash/have your vehicle be washed with water into a bucket.

If possible, do not wash/have your vehicle be washed on concrete or asphalt grounds. Prefer to wash/make your vehicle be washed on gravel ground.

Do not wash/ make your vehicle be washed with a normal hose. Ensure that your vehicle is washed with hoses with auto-stop heads. If you wash your vehicle with hoses with auto-stop heads, you save 40 liters water per each time.

Municipalities should audit vehicle washing locations required and warn the ones without equipment and hardware consuming less water at first, legal proceeding should be initiated for the ones who do not perform what is required. The cost of water used in vehicle washing locations should be high.

Washing water should be subjected to pre-treatment in vehicle washing locations and used again for washing vehicles. This system should absolutely be generalized.

The use of primarily treated waste water in washing vehicles should be promoted.

REMEMBER!!!

SAVING IS THE BEST WATER SUPPLY!



Water is Life, **Don't let it run down**

A **dishwasher** consumes an average of **15 liters of water** per wash.
A **family of 4** can save an average of **111 liters of water**
per load compared to handwashing.





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IGU for **“Ecological, Social and Economic Sustainability”**

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