

Bulacan Agricultural State College

**WATER CONSERVATION AND
MANAGEMENT PROGRAM**



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WATER CONSERVATION AND MANAGEMENT PROGRAM

The world water supply is finite and limited. As the demand for water continues to increase, the pressing need to conserve water shall increase correspondingly to preserve freshwater supplies. Water management is one of the main elements of the overall drive of sustainable development.

Water may be a significant limited resource for human welfare and is renewable only if it is well managed. It plays a leading role in promoting the resilience of the environmental, social, and economic systems in the face of the fast and unpredictable changes. Sustainable water management can be considered as the reduction of water use through changes in user behavior, accompanied by the application of water efficiency technology.

Water bills reduced as an outcome of low water consumption can be beneficial to the institutions. However, the application of water sustainable systems in institutions is an excellent opportunity for educating students about the advantages of preserving our natural resources.

These systems lead to saving finances by not wasting water and help to instill an environmentally responsible attitude in the next generation. Water conservation represents a central portion of the increasingly important issue of sustainability. It will help students focus on social liability, which is one of the major elements of sustainable development.

Bulacan Agricultural State College, the lone state agricultural college in the Province of Bulacan , in Central Luzon, Philippines that uses a considerable amount of water daily proportionate with the institution's increasing student population. Specifically, the water consumption of the College is mainly distributed through the following: agricultural and animal projects, toilets, drinking and taps, cafeteria, laboratories, outdoor playing areas, landscaping, and the on-going infrastructure development project of the institution. Hence, the institution is adapting a water conservation and management program to promote sustainable consumption and utilization of its potable water.

PURPOSE

This program defines BASC's approach in adequately managing its water usage, leading to efficiency and conservation. It shall serve the following purposes:

- decrease the water and energy costs: Water efficiency reduces the institution's water and energy costs, meaning that the institution can do more with the current institution budget;
- build young leaders and provide learning opportunities: Water efficiency activities provide excellent leadership chances and practical learning activities for the students, plus occupational development for the faculty, employees, and the other constituents;

- establish a strong institutional culture based on excellent communication and shared goals: Getting the whole institution to work together allows the institution's leadership to share successes;
- Raise the institution's profile: When the institution participates in water efficiency activities, it relates to the community through partnerships and local networks. This is increasingly important for institution reputation as students, teachers, and parents look for approaches to combat climate change and other environmental issues facing our communities; and
- Contribute to attaining a better environment through adopting water efficiency: A better and more sustainable planet will be built for the present time and for future generations.

SCOPE

Faculty, staff, students, on-site contractors/suppliers working on BASC's behalf, other non-academic employees, and visitors have a vital role to play in conserving the water resource in the College. Everyone must be responsible to use water efficiently.

METHODS AND APPROACHES

- Institution sanitation facilities are among the most widely used water facilities so water-saving appliances, such as low-flux faucets and appliances with small economic flush tanks, can be used.
- Use advanced irrigation methods such as dripping and rationalization. Choose the appropriate times for irrigation to reduce evaporation and select local plants that adapt to the nature of the site.
- Use natural water sources such as rainwater through installing formations and elements of design that work on collecting water.
- Water supply systems and sanitary tools can be chosen to decrease water consumption and losses. The use of low- flow water taps and small toilet tanks can be a practical solution to reduce clean water consumption.
- The building's needs for clean water can be minimized by using institution roofs to collect rainwater using water storage tanks. It may be used without treatment to irrigate the plants or to feed the flush tanks of toilets and bathrooms.
- Diminish the quantities of water required to run the institution either indoors or outdoors.

- Growing plants that fit into the local environmental system of the institution site minimizes the consumption of water. Local plants adjust to the natural rainfall and don't demand additional irrigation. When irrigation is needed, advanced irrigation techniques must be utilized to prevent wastewater.
- Assess various water uses: distinguishing between those that can be fulfilled using raw water (untreated), and those requiring treated water.
- Assess strategies to provide the desired raw water supply using the resources available on site.

INDOOR WATER CONSERVATION APPROACHES

- Install timed taps or motion sensors that will automatically close when not in use.
- Buy water-efficient toilets and taps soon. Substitute old models with more advanced ones that utilize less water, and can sustain their value over the lifetime of the fixture.
- Use toilet dams. In institutions with toilet tanks, put toilet dams inside the tank to take up space that would otherwise be filled with water.
- Repair any leakage in taps and water fountains.
- Install aerators. These devices are installed at the tips of the taps to decrease water flow and maintain high water pressure.
- Replace old showerheads and faucets with new down-sized models to reduce water use during showers in locker rooms.

OUTDOOR WATER CONSERVATION APPROACHES

During the construction process, enhance irrigation systems properly by setting up an automatic shut-off appliance on sprinkler systems when the rain falls. Make the best use of natural plants and preserve the landscape.

Local species are particularly suitable for this, as they adapt to rainfall conditions. Thus, grasses and trees that require minimal water will be used.

Using drip irrigation systems to irrigate plants and adding organic fertilizers or other alternative organic manure to the soil. This will help the soil retain water so that institutions will not have to consume the water continuously.

Install buried humidity sensors and connect them to watering timing devices to supply the roots with the appropriate quantity of water, and then turn off watering systems.

WATER EFFICIENCY SOLUTIONS

Infrastructure

- **For toilets:** Install modern flush toilets that will use less water in flushing;
- **For toilets:** Install modern flush toilets that will use less water in flushing;
- **For drinking fountains and taps:** Place containers under institution water fountains and utilize excess water in the garden;
- **For gutters and rainwater tanks:** Set up rainwater tanks to collect water to be used for gardening/ or flushing toilets. The gutters will be maintained by keeping them clear, so rainwater doesn't overflow and does not make it to the collection system;
- **Gardens and ovals:** Plant local drought-tolerant plants that are more suitable for the local climate understand the water efficiency of the oval irrigation system;
- **Irrigation system:** Install moisture sensors that activate the irrigation system only when the garden needs it..

Behaviors

- **Daily water use:** Turn off taps when not in use and consume only what is needed. Set out good systems and practices so that everyone thinks about the water they utilize each day.
- **Cleaning:** Utilize a broom to sweep away leaves and dirt instead of washing pathways.
- **Gardening and Irrigation:** A deeper and less frequent irrigation can be better than daily light irrigation.
- **Other institution users:** If other people also utilize water, they need to be educated and encouraged to follow the water conservation and management program of the university.

Engage in the Community

- Building relationships with parents, local businesses, and community groups can help achieve goals through care and hands-on support.
- Keep going and teach outside the institution gates to have a more profound impact regarding water efficiency and literacy in the community.

GUIDELINES

Guidelines for BASC Water Conservation and Management for potable sustainable water consumption (adopted from El-Nwsany et al. 2019 with some modifications)

Work along with the local water authority.

- Discuss how the institution will conserve water and how to set realistic goals.
- Induce the institution to promote water conservation among students, faculty, and employees.
- Teach about water sustainability in the institution and how effective it is.
- Get publications, posters, and activities that promote water conservation in the institution.
- Evolve a water efficiency plan that translates opportunities into scheduled action.
- Read meters monthly. Analyze water use over an institution year and terms.

Foster water conservation culture among staff, students, and parents

- Create a log so that staff, students, and cleaners can report damaged or leaking devices and appliances and make sure there is someone responsible for fixing the leaks.
- Hold institutions or community occasions that target water conservation actions and wastewater problems.
- Teach about water sustainability in the institution and how effective it is.
- Compare and discuss water utilization over the year, beginning with the start of the program of water conservation.
- Publish banners, posters, and colorful signs to enhance water conservation.
- View the progress on advertisement boards and screens throughout the institution.

Harvest and recycle rainwater.

Build a rainwater collection system for plant irrigation and various non-potable uses.

Create water-efficient irrigation methods

- Set up an irrigation timeline for seasonal changes over the year.
- Adjust the automatic shutdown appliance on the sprinkler systems when the rain falls.
- Make certain all the hoses have shut-off nozzles.
- Install systems of drip irrigation on trees, shrubs, and sapling in a place of sprinklers to save water.

Go “low flow”

- Fixing low-flow water aerators or motion sensor faucets that will close automatically when not in use
- Induce the institution to promote water conservation among students, faculty, and employees.
- Introduction of water displacement devices, which have parallel packs or bottles in toilet tanks
- Re-adjust the water flow meter or tank with the water-saving toilets to dispense one gallon per flush.
- Substitute old latrines, showerheads, and taps with low-volume regulator and timers.

Minify water cooling and conditioning

- Shutting the water-cooling systems, if not in use
- Reducing cooling requirements by adjusting the air temperature regulator.

Repair leaks

- The institution should regularly check for leakages as part of their maintenance schedule or as a main task of their water ‘team’.
- One leaky toilet will waste quite 50 gallons of water every day.
- A dripping regulator or showerhead will waste up to 1,000 gallons per week.
- Observe the faucets and toilets within and outside the institution repeatedly.
- Check for leaks and set dates for reporting and repair.
- Utilize the logbook/register to see if there are unexpected water leakages after working hours.
- The isolation valves can be utilized on water pipes to isolate leakage.

Use the institution landscaped plots to attain water efficiency

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Reduce water used in food preparation

- Exchange standard pre-rinsing spray valve with low flow models.
- Promote the use of a dishwasher, as it uses 6 gallons while hand washing uses 3 gallons a minute.
- Vacuum and sweep floors and walkways instead of using water when possible.

Repair running water issues

- Check the areas around the institution for corrosion because of rain-runoff.
- Utilize penetrating roofs for parking zone and other areas.
- Teach about water sustainability in the institution and how effective it is.
- Get publications, posters, and activities that promote water conservation in the institution.
- Evolve a water efficiency plan that translates opportunities into scheduled action.
- Read meters monthly. Analyze water use over an institution year and terms.

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