

Establishing and Assimilating the Irrigation System Project in the University City

The Department of Sustainability and Environmental Development is keen to overcome the most important problem of agriculture in the Kingdom, which is water scarcity. Through Establishing and Assimilating the Irrigation System Project in the University City, the administration sought to increase vegetation and reduce water consumption at the same time by focusing on the following points in the project:

1 .Growing plants that suit Riyadh weather conditions:

The Sustainability Department selected plants that have the ability to withstand high temperatures and thirst.

2 .By increasing the storage capacity of irrigation water:

The project included the construction of two tanks with a total volume of 8,000 cubic meter to increase the storage capacity of irrigation water in the University. Large quantities of treated water are drained into flood sewers or transferred to the sewerage Riyadh during winter, while large quantities of irrigation water are supplied during the summer from outside the university.

3 .Completing irrigation systems:

The project includes completing of irrigation systems in some university locations. This will save the University the costs of transporting water from within or outside the University to agricultural sites, in addition to saving the amount of irrigation water used and providing manpower on site. This will overcome the problem of stopping water tanks on the roads, etc... which causes traffic accidents and congestion.

4 .Completing the irrigation tanks used systems:

The project included completing the following irrigation tank used systems

- A - Irrigation tank for the second phase of faculty and staff housing.
- B- The irrigation tank for the third phase of faculty and staff housing.
- C- Irrigation tank in sports halls.

By connecting these tanks, the saved costs of transporting and supplying irrigation water were estimated at 1,500,000 to 2,000,000 riyals annually, while utilizing the treated water to fill tanks directly.

5. Working to complete the irrigation water management system to raise the irrigation process efficiency.

In the project, an integrated control system will be established to operate and monitor the irrigation process. The system includes the installation of smart field controllers that manage irrigation water on site and send instant reports to the control center on the irrigation process progress and receive and implement orders. The system also includes a meteorological station to calculate the plant's actual need for irrigation water, depending on the weather conditions the previous day. The central controller sends the irrigation program to the field controllers on a daily basis.

The central control system allows monitoring the operation system and the system operating times then configuring them in response to the occurred system conditions or the surrounding area (weather conditions and pipe fractures). The system also provides historical data to allow analysis of the devices that were operated, the timing of their operation, the amount of water that was used, and site problems with a report attachment, which will provide the following points:

- A - Saving the quantities of water used, as the central control system can manage the quantities of used water in irrigation to save up to 30-50% per year, as plant irrigating relies on the appropriate quantity of evaporation rate and transpiration calculated by the meteorological station connected to the system. The system automatically monitors and

detects fractures in the pipe network using precise sensors to avoid wasting large amounts of water.

B - A natural and healthy site, where the central control system ensures that the site receives the appropriate and required amount of water, which reflects positively on the plants health and the environment of the site itself and the places surrounding it.

C - Lower labor costs by organizing irrigation schedules using the central computer. The user will no longer need to adjust the schedule for each unit on the site, which reduces the number of workers needed for this.

D - Preserving agricultural soil. The central control system continuously monitors the hydraulic conditions of the irrigation system and takes the necessary measures to prevent soil erosion in the event of pipe breakage. The process of detecting and isolating breakages takes place in minutes instead of hours.