Why is it needed?

Maintaining gardening in vast areas such as Campuses is difficult and consume a lot of workforce which is not ideal. Systems set in place for such managements are quite inefficient as seen from a technological point of view as they still have not utilized the technological advancements that tre currently available. The automated system for gardening will help relive workforce demand ,which could be used else where, manage water consumption and help students of technology get a grasp for what technology can be used for

Nature of the research?

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Abstract/Summary

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Abbreviations

B.D.U – Bahirdar University

**Introduction/Background**

Gardens are a safe house. They are a means of recollecting oneself and have proven they are effective in the line of healthcare and workplace environment in reducing stress and boosting creativity. An extract of a study on the effect on garden in workspace highlights that studies in landscape architecture, health, and horticulture disciplines have produced evidence that gardens in the workplace and even indoor plants and views of green space can help to reduce stress(Helena Chance,2015,2).

As such many organizations such as Bahirdar university, have incorporated these ideology in their landscape design to help boost creativity and to create an open and inviting environment. But the use of technological solutions have been neglected in the field of gardening at B.D.U. The means of supplying and managing water has long been done through manual labor which though is tiresome, has yielded great outcomes ,through the dedication of the workers. But a lack of technology in garden keeping has restrained the outcome of what it could be. The use of technological solutions such as sprinkler technologies and control unit models can in our belief give way to an easier and efficient management of water and gardening actives.

Water is a vital resource which needs to be dealt with care. As a university body ,Bahirdar university poly campus, consumes a lot of water for different activities where one of them is gardening. Therefore an efficient system needs to be in place for managing water resources as the neglect of these will result in a major water wastage. \

Currently to manage water for gardening the university has employed many staff whom use plastic hoses , where some of the lines has been cut due to wear and tear . The have to put effort when they want to transport the hose from on part of the campus to other, especially from the faculty of Electrical and Computer Engineering to Digital Library. These transportation as we addressed earlier will wear and tear the hose and will give way to water leakage where often plastic or rubber is used to insulate it which is ,in most cases, ineffective. Also to scale the current watering system will require a huge workforce and network of hoses which have to be maintained consistently due to the factor addressed.

The use of sprinkler technology and controlling unit is an effective means for supplying and managing water resource. The utilization of a low pressure sprinklers is key as the supply for high pressure water piping is not currently available. As stated in (Hong Li,2019,1) the use of low pressure sprinkler technologies in supplying precision water is invaluable. Incorporating this technology together with control units such as arduino as demonstrated by (Ipin Prasojo ,web ,Design of Automatic Watering System Based on Arduino) or by using microcontroller as demonstrated by ( Abhishek Gupta, web,Automatic Plant Watering System) is an effective solution.

The other crucial part of our research implores the effect of showcasing students new technologies in action and the implication it has on their creativity and motivation in study. In campuses the effect of campus environment on students motivation has been a key consideration in the design of campuses. Exposing students to innovative outlooks through display of innovative technologies is key in motivating students to create , innovate and explore new things . (Vinny Stephanie,H ,3) have stated that , “Campus environment affects the students Learning Motivation. Universities can continuously improve the campus environment, so that the comfort of students in their activities will increase.”

**Literature Review**

Water is vital especially in regions prone to drought and which are mostly rain fed. Giving the proper amount of water exactly at the desired place is key for effective yield and the minimization of water consumption .The main technologies utilizing water management schemes are of those in the irrigation sector and there have been many developments. We can apply similar schemes for our gardening research on a small scale by adopting such technologies.

Many advancements in sprinkler technologies as well as electronic control units have allowed sectors such as agriculture to benefit from the fruits of its innovation. It has been demonstrated by (Abhishek Gupta, Automatic Plant Watering System) by the use of a PIC microcontroller , timer circuit , a 4x4 keypad , LCD screen , relay circuit and a custom made soil moisture sensor that they can achieve in building an automatic plant watering system. The use of microcontroller with an interfacing device such as a keypad for setting time of watering is an essential design system of this research. Relays are used to carry out electrical command signals to mechanical outputs, in here by shutting of the pump. Though the significance of the study is key this research lacks in showing how to effectively distribute the water to the field but still highlights water effect on plants.

Controller devices such as ardunio and copper plated moisture sensors are utilized in projects done by (ipin Prasojo, Design of Automatic Watering System Based on Arduino) . They have tested and analyzed different soil conditions to get a threshold value for moisture sensitivity. Other researchers such as Prema Kannan(web , Design and Implementation of Fuzzy Logic Controller for Online Computer Controlled Steering System for Navigation of a Teleoperated Agricultural Vehicle), have made use the concept of fuzzy logic and teleportation to sense moisture and make controls automatically.

The sprinkling technology which is nonetheless vital in the design of a gardening system have seen many advancements for the better. Sprinklers uses mechanical and hydraulic devices to apply irrigation water to the soil surface. As highlighted by the study of Hong Li(Overview of emerging technologies in sprinkler irrigation to optimize crop production) the use of low pressure sprinklers have come to dominate but the cost of installing them is ever increasing with the demand of them rising.

Though sprinklers are great crops remains wet after watering without a control unit integrated, thus increasing incidence of pests or diseases. Another challenge in sprinkler systems is how to avoid runoff. A properly designed sprinkler irrigation has higher application efficiency that can avoid runoff.

Therefore by using technologies that are cheap and are currently under our disposal such as microcontrollers , relays and sprinkler technologies we can help manage water management in gardening sector.

**Statement of the Problem**

Bahirdar university in total has 8 campuses to which Poly is one of them. Poly campus seats at the heart of Bahirdar and is a beacon of engineering mind-sets and solutions. The campus has a vast amount of land allocated to it through which the majority is covered in greenery landscape designs. As such the proper caring of this greenery plants and vegetation plays an integral role in the development of a caring and hospitable environment. The method that is currently being used to water the plants and vegetation is a tiresome and time consuming task. Gardeners use a hose to water them and in many occasions the hoses they use will tear and leak due to the fact that transportation of these long hoses in the campus roads is difficult and will in most cases ware and tear them. We plan to design an automated watering system which will incorporate the already existing piping and will possess a control station together with a water dispersing station which will help manage water resource.

**Objective/Aim of the study**

MAIN OBJECTIVE

* Designing an automated water supply system for gardening at BDU

SPECIFIC OBJECTIVE

* Designing a control unit for the distribution of water
* Selecting an effective water dispersing unit
* Designing the layout of the system for the test environment
  + The test environment will be the green area found in front of Gion building

Research Methods and Procedures

Scope

Significance of the Study

Work Plan

Budget

References

Appendix