Smart Garden (SaGa); Design of an Automatic Drip and Protective Irrigation System Using Rain and Soil Moisture Sensors on Plantation Land

ABSTRACT

Water is a very important requirement for agricultural purposes. An efficient and effective smart water management system, namely "automatic irrigation system using an Arduino Uno microcontroller" is offered as a solution to inefficient irrigation. The aim of this research is to analyze the differences resulting from an automatic drip irrigation system using an Arduino Uno microcontroller with a conventional system, as well as providing automatic protection against extreme weather factors. For this reason we designed Smart Garden (SaGa); Design of an Automatic Drip Irrigation and Protective System Using Rain and Soil Moisture Sensors on Plantation Land. SaGa is designed to stop air entering when it rains, protecting plants from the negative impacts of overwatering. The design of this research includes hardware design, raindrop sensor circuit, soil moisture sensor circuit, software design and Smart Garden Prototype Circuit. The SaGa system is regulated in two conditions, namely dry soil and wet soil conditions. If the soil is dry and the weather is sunny, the protector will open and the water tap will open to water the plants, if the soil is dry and the weather is rainy, then the protector will open and the air tap will be closed, if the soil is wet and the weather is sunny, then the protector will open and the tap the air will be open to water the plants and if the ground is wet and the weather is rainy, the guard and tap will be closed. The irrigation system can also smoothly deliver water to the plants through a hose connected to the box. All works effectively and efficiently.

Keywords: Arduino uno, SaGa, Sensor