Automatic water supply to Fields Based on variation in humidity range using wireless sensors

[1]**Gaja lakshme K.R, Department of Information Technology,MEPCOSchlenk Engineering college** kajoldoss97@gmail.com

[2]**Mrs. S. Kavi Priya M.E,** (Ph.D).,Assistant Professor (Senior Grade) , **MEPCO Schlenk Engineering college, Sivakasi.**urskavi@mepcoeng.ac.in

Abstract:

Agriculture uses 85% of available freshwater resources worldwide, and this percentage will continue to be dominant in water consumption because of population growth and increased food demand. There is an urgent need to create strategies based on science and technology for sustainable use of water, including technical, agronomic, managerial, and institutional improvements. An automated irrigation system was developed to optimize water use for agricultural crops. The system has a distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. Field conditions were site-specifically monitored by six in-field sensor stations distributed across the field based on a soil property map, and periodically sampled and wirelessly transmitted to a base station. An irrigation machine was converted to be electronically controlled by a programming logic controller that updates georeferenced location of sprinklers from a differential Global Positioning System (GPS) and wirelessly communicates with a computer at the base station. Communication signals from the sensor network and irrigation controller to the base station were successfully interfaced using low-cost Bluetooth wireless radio communication. In addition, a gateway unit handles sensor information, triggers actuators, and transmits data to a web application. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a microcontroller-based gateway to control water quantity. The system was powered by photovoltaic panels and had a duplex communication link based on a cellular-Internet interface that allowed for data inspection. The automated system was tested in a sage crop field for 136 days and water savings of up to 90% compared with traditional irrigation practices of the agricultural zone were achieved. Because of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated areas.

Objectives:

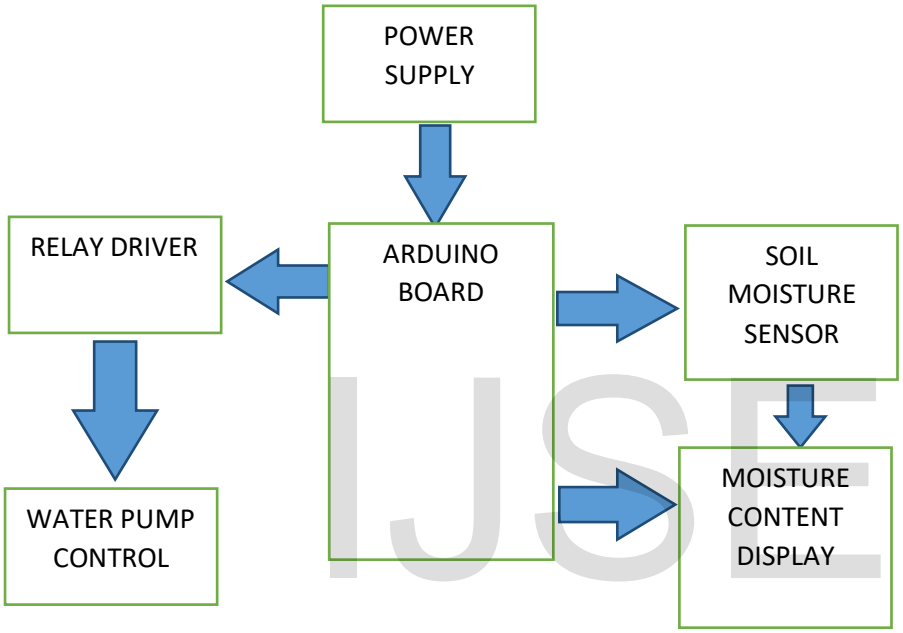
- Water depth measurement system
- Soil moisture measurement system
- Temperature and humidity measurement
- Limited useage of water durin irrigation

Introduction:

The continuous increasing demand of food requires the rapid improvement in food production technology. In a country like India, where the economy is mainly based on agriculture and the climatic conditions are isotropic, still we are not able to make full use of agricultural resources. The main reason is the lack of rains & scarcity of land reservoir water. The continuous extraction of water from earth is reducing the water level due to which lot

of land is coming slowly in the zones of un-irrigated land. Another very important reason of this is due to unplanned use of water due to which a significant amount of water goes to waste. In modern drip irrigation systems, the most significant advantage is that water is supplied near the root zone of the plants drip by drip due to which a large quantity of water is saved. At the present era, the farmers have been using irrigation techniques in India through manual control in which farmers irrigate the land at the regular intervals. This process sometimes consumes more water or sometimes the water reaches late due to which crops. Get dried. Water deficiency can be detrimental to plants before visible wilting occurs. Slowed growth rate, lighter weight fruit follows slight water deficiency. This problem can be perfectly rectified if we use automatic micro controller based drip irrigation system in which the irrigation will take place only when there will be acute requirement of water.

Block Diagram:



Implementation Details:

The basic technique for measuring soil water content is the gravimetric method. Because this method is based on direct measurements, it is the standard with which all other methods are compared. Unfortunately, gravimetric sampling is destructive, rendering repeat measurements on the same soil sample impossible. Because of the difficulties of accurately measuring dry soil and water volumes, volumetric water contents are not usually determined directly.

Conclusion:

The automated irrigation system that will be implemented would be feasible and cost effective for optimizing water resources for agricultural production. The system would provide feedback control system which will monitor and control all the activities of drip irrigation system efficiently. This irrigation system will allow cultivation in places with water scarcity thereby improving sustainability. Using this system, one can save manpower, water to improve production and ultimately increase profit.

References:

[1]Klute, A. (ed.), 1986: Methods of Soil Analysis, Part 1: Physical and Mineralogical Methods. American Society of Agronomy, Madison, Wisconsin, United States, 1188 pp.

[2] Knight, J.H., 1992: Sensitivity of time domain reflectometry measurements to lateral variations in soil water content. Water Resources Research, 28, pp. 2345–2352.

[3] Magagi, R.D., Kerr, Y.H., 1997. Retrieval of soil moisture and vegetation characteristics by use of ERS-1 wind scatterometer over arid and semi-arid areas. Journal of Hydrology 188-189, 361–384.

[4] Marthaler, H.P., W. Vogelsanger, F. Richard and J.P. Wierenga, 1983: A pressure transducer for field tensiometers. SoilScience Society of America Journal, 47, pp. 624–627.

[5] Attema, Evert, Pierre Bargellini, Peter Edwards, Guido Levrini, SveinLokas, Ludwig Moeller, BetlemRosich-Tell, et al 2007. Sentinel-1 - the radar mission for GMES operational land and sea services. ESA Bulletin 131: 10-17.

[6] A.Suresh (2016), "Speech Stress Analysis based on Lie Detector for Loyalty Test", in International Journal of Printing, Packaging & Allied Sciences,(IJPPAS) ISSN: 2320- 4387, *Vol. 04, No.01, December 2016,* pp.*631* – 638.