



## **A LOW COST PORTABLE TEMPERATURE-MOISTURE SENSING UNIT WITH ARTIFICIAL NEURAL NETWORK BASED SIGNAL CONDITIONING FOR SMART IRRIGATION APPLICATIONS**

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*Abstract- The recent trends in developing low cost techniques to support cost effective agriculture in developing countries with large population has motivated the development of low cost sensing systems to provide for low cost irrigation facilities and also to provide for conservation of water at the same time. The current paper highlights the development of temperature and soil moisture sensor that can be placed on suitable locations on field for monitoring of temperature and moisture of soil, the two parameters to which the crops are susceptible. The sensing system is based on a feedback control mechanism with a centralized control unit which regulates the flow of water on to the field in the real time based on the instantaneous temperature and moisture values. Depending on the varied requirement of different crops, a lookup table has been prepared and referred to for ascertaining the amount of water needed by that crop. The system based on a microcontroller has been applied on rice and maize fields spanning over area of 1 acres each for 3 weeks and more than 94% of the*

*plants were found to be alive after experimentation. The cost of the system has been estimated to be as low as 120 INR and is therefore easily deployable in developing countries.*

**Index Terms:** Moisture Sensing, ANN, temperature drift compensation, linearization