

# Review of: "Integration and Implementation of Multiple Soil Sensors for Automated and Regulated Irrigation"

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**Potential competing interests:** No potential competing interests to declare.

The manuscript shows a detailed description of the research work and promising results from the experiments conducted at the site. Some amendments to the writing style are needed so that it is easier for the reader to understand the research work.

## Comments:

1. **Abstract:** Should the abstract consist of introduction, problem statement, objective, methodology, result, and conclusion? From this manuscript, there is missing information on the method used/proposed. Needs some description about the systems proposed, at least 2-3 sentences. The results should be reported as ...soil parameters ranging from a strong  $R^2$  (0.88) to a very strong  $R^2$  (0.98)... (line 7, abstract).
2. **Introduction:** Referring to the statement of objective (a) (identify the measurands, develop, source, and adapt appropriate sensors for monitoring some selected soil properties), what is the purpose of objective (a) since there is a term "develop" in objective (a)? I believe that at this stage, the research is focusing on the identification of the systems proposed from the previous research work. Once the theoretical part of the systems has been studied appropriately, then the development of the systems will proceed as in objective (b).
3. Referring to Figure 2, it is shown that there is a soil moisture sensor, a temperature sensor (DB18B20), and a 7in1 soil nutrients sensor. The 7in1 soil nutrients sensor consists of soil moisture and also soil temperature. Why does this system need 2 soil moisture sensors, and what is the purpose of the 7in1 soil nutrients sensor?
4. Under 2.1.1.1, there are explanations about the Arduino Mega 2560 and the ATmega8 Microcontroller, which are in Figure 21. Only the Arduino Mega 2560 is shown as the controller? The Arduino Mega 2560 is also a microcontroller, so why does this project need 2 controllers? Referring to the explanation about the button switch, it is mentioned about the push button. This button needs to be pressed to make sure there is a current flow, so where the actual push button would be inserted? I guess this project is using a single pole switch.
5. Referring to Figure 24, all the red boxes are wrongly inserted. Suppose the arrow after 'Start irrigation' is connected to the decision block 'Is irrigation'. For the decision block 'Is soil moisture <threshold value', if the answer is Yes, suppose the arrow goes to the block of 'Acquire data from sensors'.

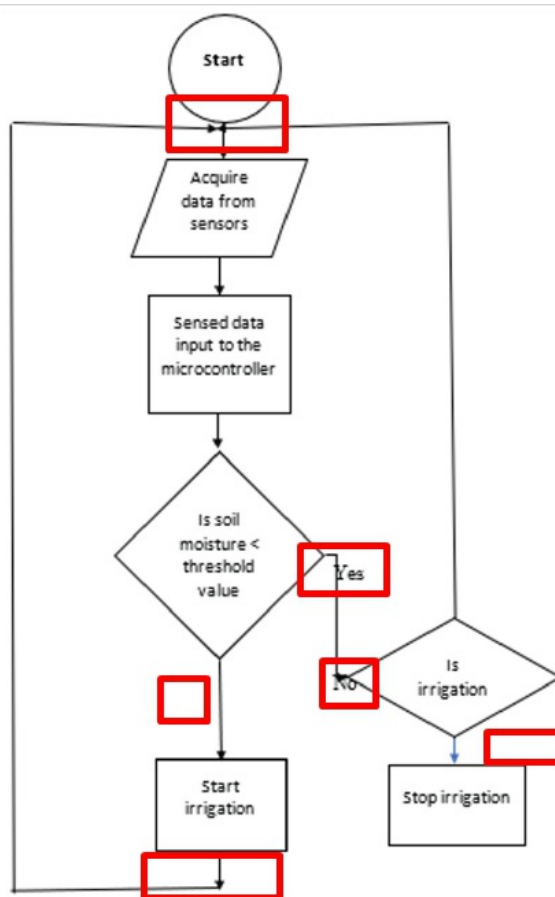


Figure 24. The algorithm flowchart of the system

6. For the result, it is suggested to combine Table 3, Table 5, Table 7, Table 9, Table 11, Table 13, and Table 15 with the 1st column as Type of sensor.
7. Some references cited in the text are not listed in the references section: Aziz et al., 2009; Dursun et al., 2011; Kumbhar & Ghatule, 2013; Shabadi & Patil, 2014; Payero et al., 2017; Krishnan et al., 2020; Naeem et al., 2021, Duarte and Coaguila Nuñez (2024).
8. One reference not cited in the text: Xu, G., Zheng, J., Du, C., & Yuan, P. (2022). Development of a portable soil nutrient sensor based on near-infrared spectroscopy for in-situ measurement of soil nitrogen, phosphorus, and potassium. *Sensors*, 22(2), 591.