



Kasegaon Education Society's

Rajarambapu Institute of Technology, Rajaramnagar

(An Autonomous Institute)

(Approved by AICTE, affiliated to Shivaji University Kolhapur)

FULLY AUTOMATED IRRIGATION SYSTEM FOR EFFICIENT USE OF WATER AND ELECTRICITY

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INTRODUCTION

WATER LEVELS

- Ground water level is decreasing
- 8.8 crore acre-feet in the last decade
- there is definite need of an efficient solution of irrigation automation.

ENERGY USAGE

- 20-22% of total energy consumptions consumed by agriculture sector

NEED

PROBLEM ?



OBJECTIVES



RESEARCH METHOD : PRESENT TECHNOLOGIES

There Are Two Major Technologies In The Market

TIMER BASED

- 1.Timer decides on and off of motor
- 2.motor turned on after completing of 1 Timer
- 3.Motor turns off after completing of 2nd Timer.

MOISTURE BASED

- 1.Turning on and off of motor is decided by moisture sensor.
- 2.Motor turns on if moisture sensor detects no water in soil.
- 3.Motor gets off when moisture sensor detects water

RESEARCH METHOD : SURVEY

VISIT TO TIMER BASED SYSTEM At - SUMAN AGRO INDUSTRIES



**AUTOMATED
DRIPPER**



**CONTROL
UNIT**



**CONTROL
CENTRE**

RESEARCH METHOD : DEMERITS

PROBLEMS WITH TIMER BASED SYSTEM

- Soil behaves differently in different climates.
- Need of water is different for different time.
- We can set time only ones no automatic control over water level in the soil .
- Open loop system - Therefor NO FEEDBACK

PROBLEMS WITH MOISTURE BASED SYSTEM

- We cant rely only on the data given by moisture sensor.
- As soon as water touches sensor motor turns off.
- Only applicable for smaller models.
- Not used vastly commercially.

RESEARCH METHOD : OUR SOLUTIONS



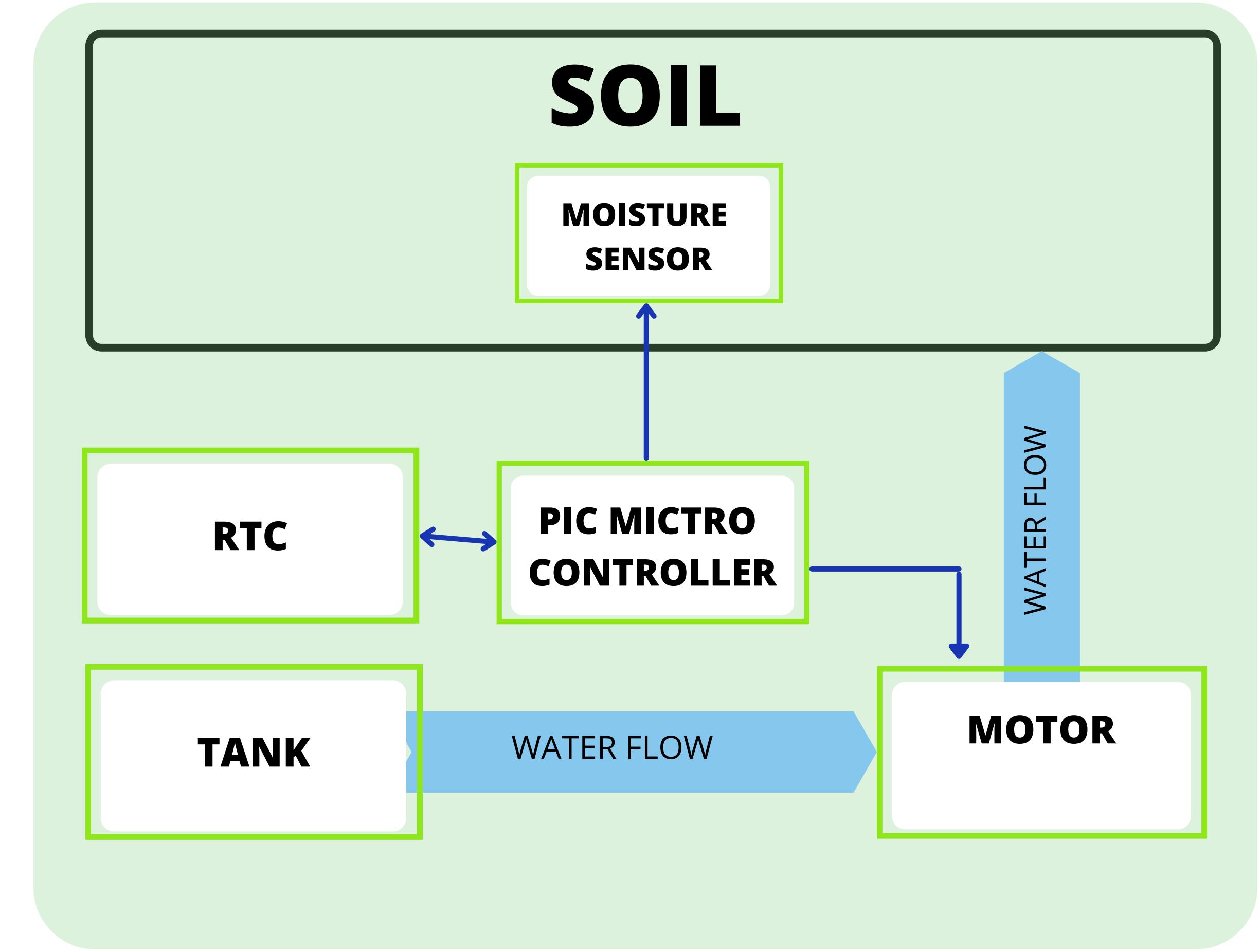
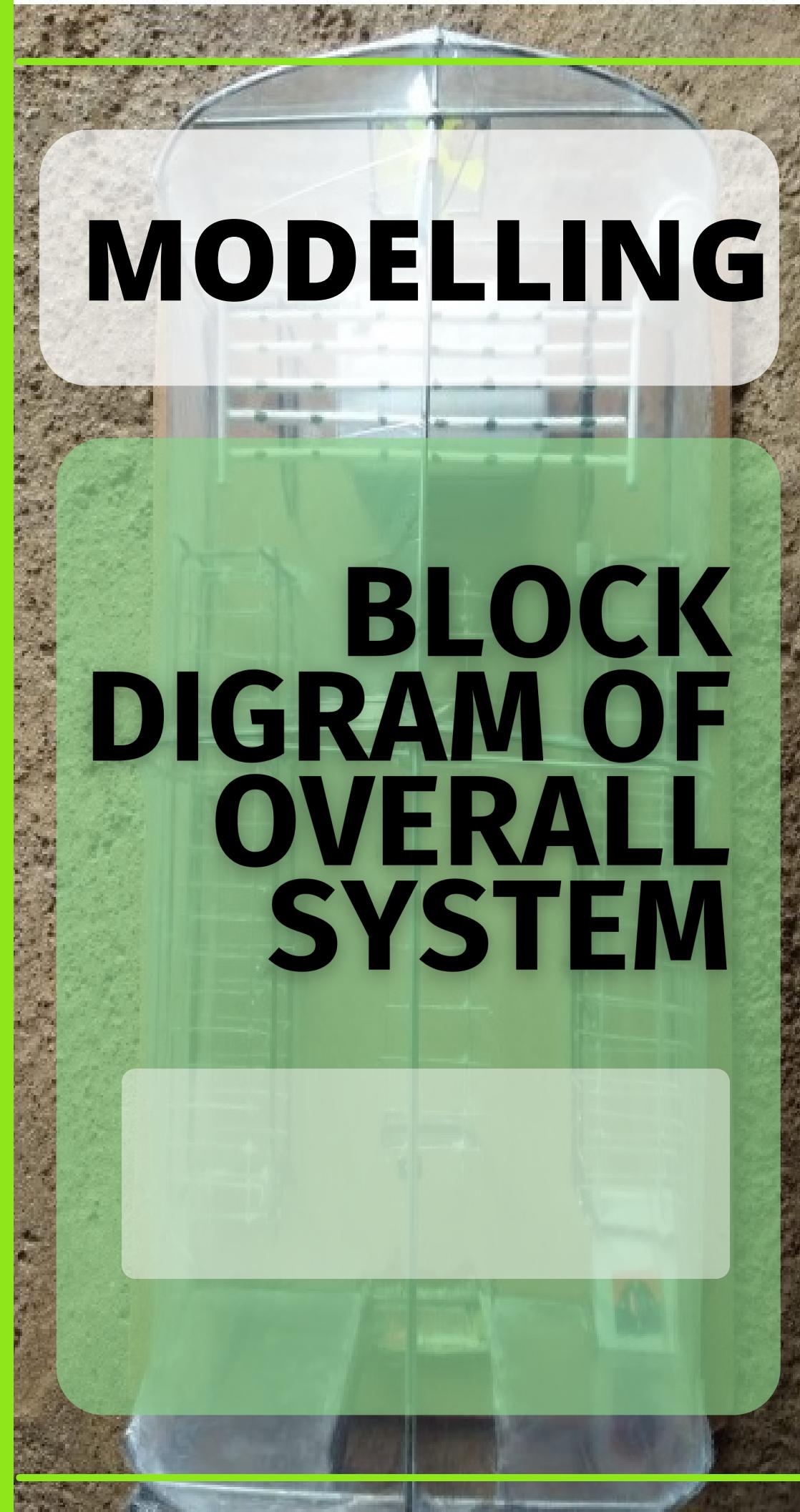
INTEGRATION OF TIMER AND MOISTURE SENSOR

Motor will be on and off with timer . moisture sensor will act as a feedback.
Timer will be reset automatically according to climate



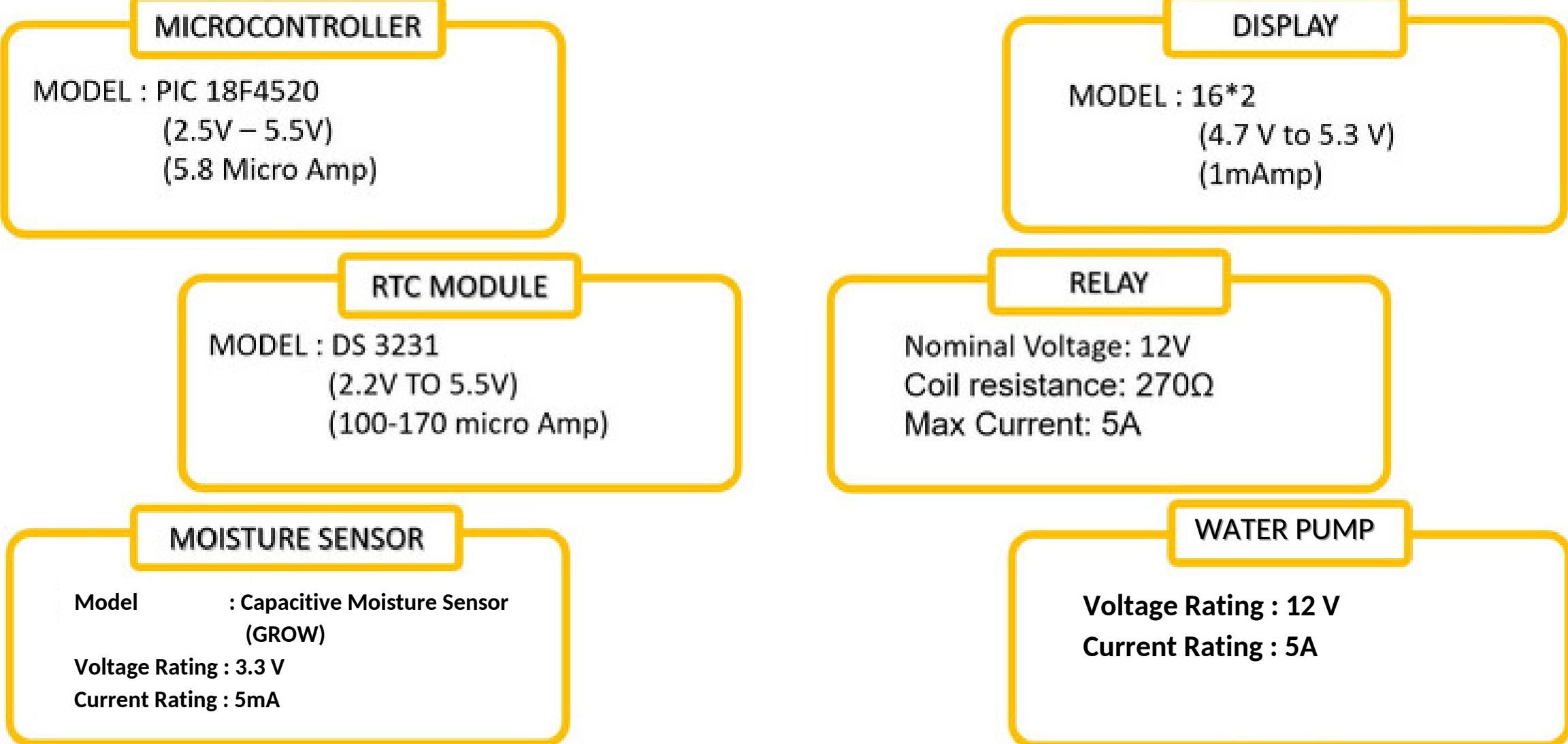
Provide full life cycle irrigation plan for particular plant

Optimum Preset will be given to particular kind of plant



MODELLING

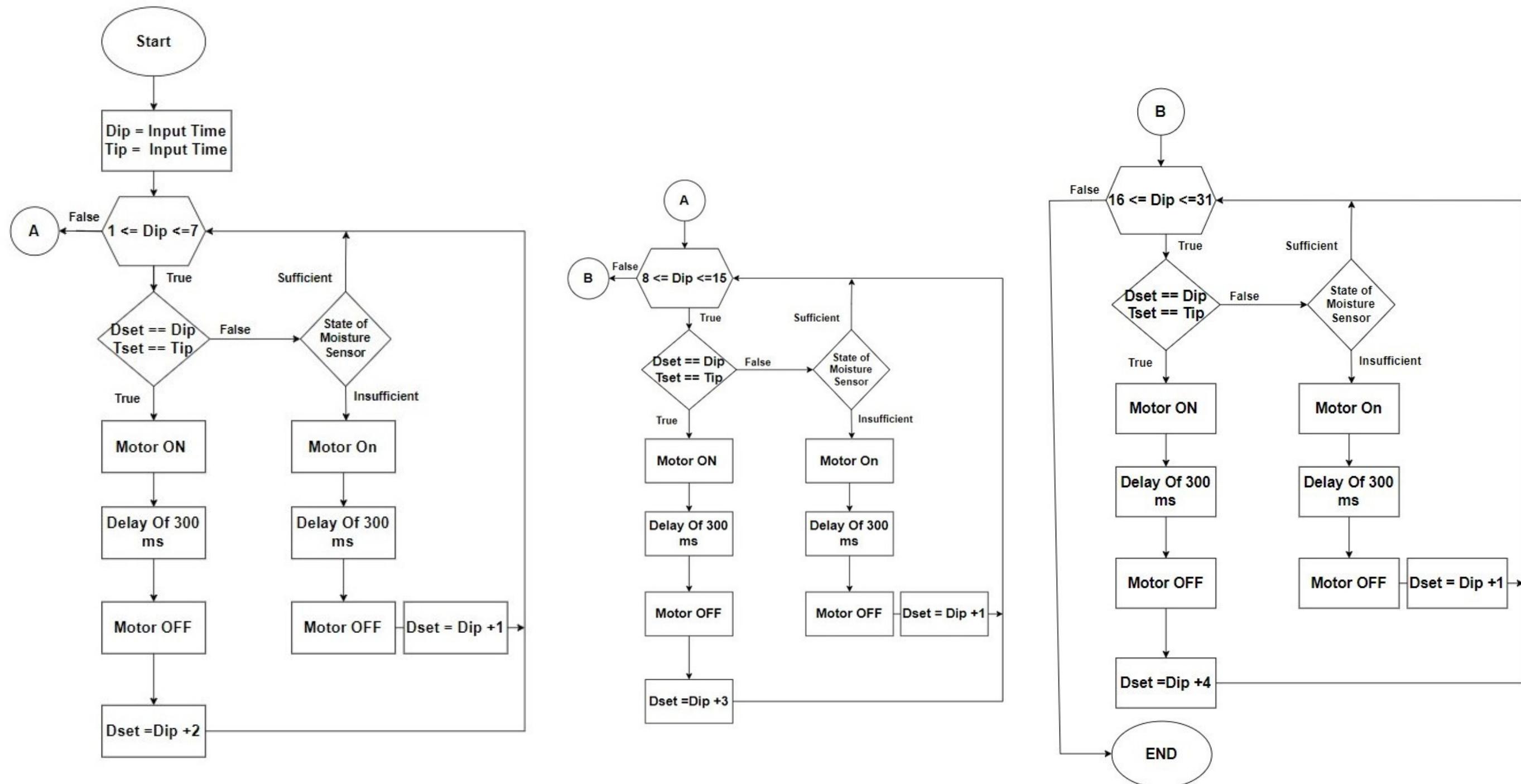
SPECS OF COMPONENTS



MODELLING

FLOWCHART FOR AUTOMATED IRRIGATION

FOR CORIANDER
CROP (DUMMY)



MODELLING

WORK DONE

FOR CORIANDER
CROP (DUMMY)

MAKING OF TEST BENCH



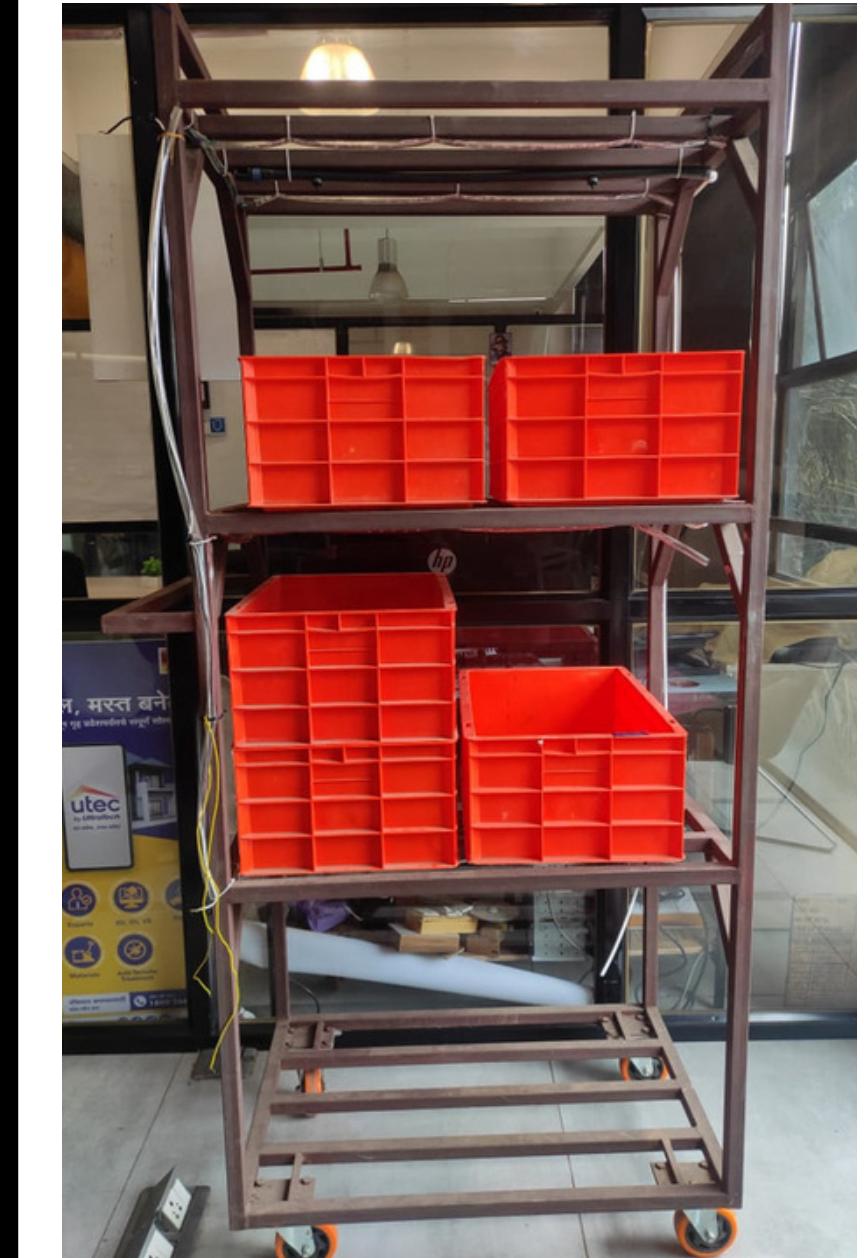
MAKING OF GREENHOUSE



B.I. COMPETITION



TEST BENCH - MODEL D





Electricity used by 1 microcontroller kit

1 Watt per hour

Electricity used by 12 Volt Motor

60 Watt per hour

Electricity used by 12 Volt Motor

$60+1 = 61 \text{ W}$

For Green House Containing 6 Racks

$61*6 = 366 \text{ W per hour}$

Maximum motor on for 30mins then total electricity usage in a day

183 watts

Total usage of the month

$183*30 = 5490\text{W}$

Total Units consumed

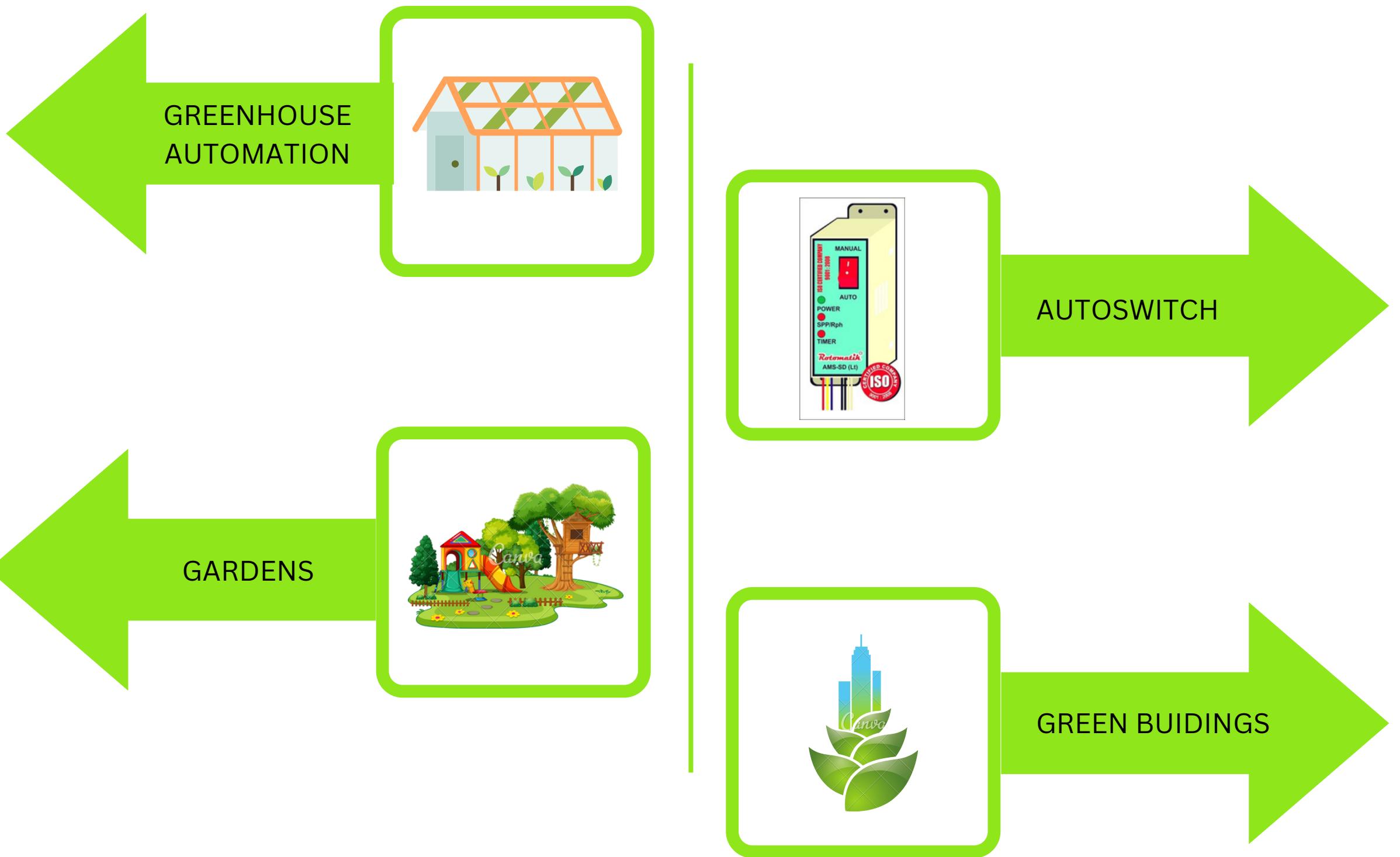
5.490 Units

total running cost of the month

$5.36*5.490 = 29.42 \text{ rs}$

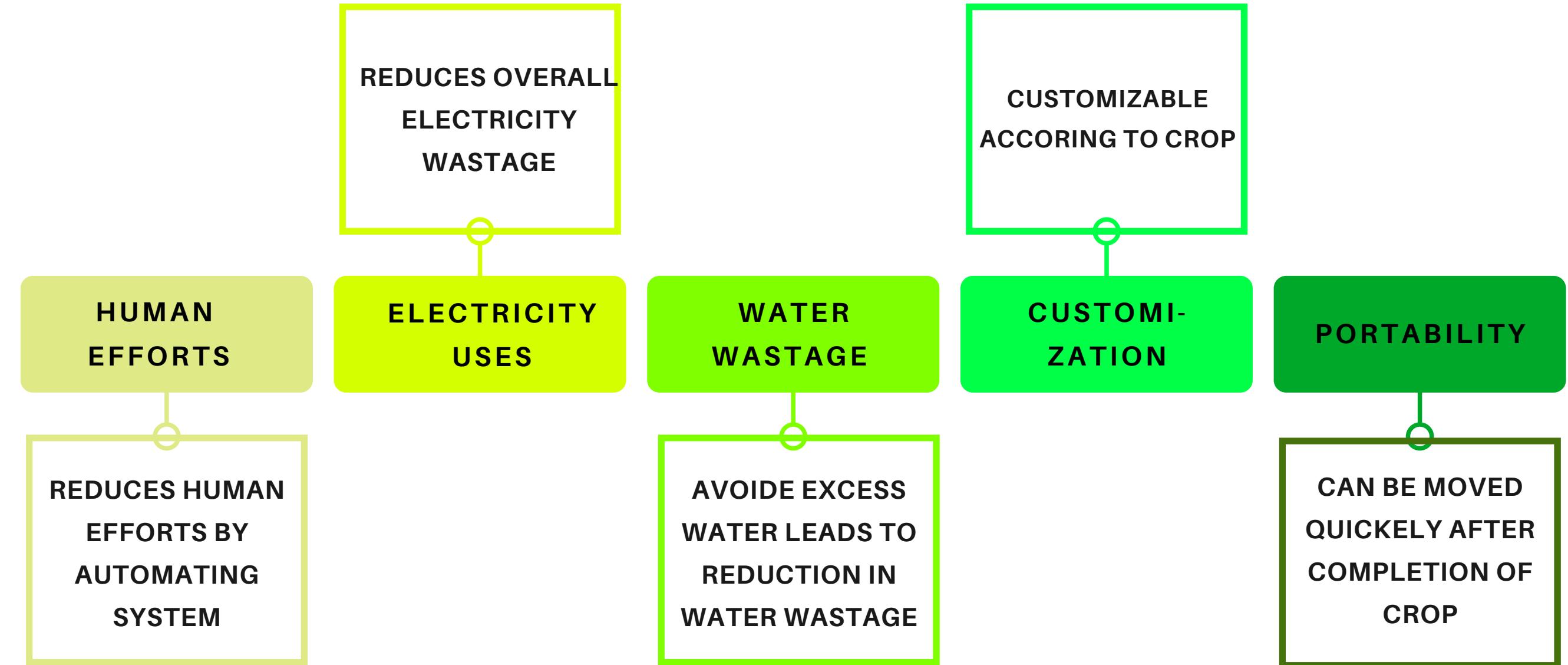


IMPLICATIONS





BENEFITS





CONCLUSION

PROGRESS

COMPLETED

- Problem Identification
- Literature survey
- Solution
- Half code (simulation)
- Moisture part
- Testbench
- greenhouse

WORKING ON

- RTC Interfacing
- Moisture sensor calibrations.
- optimum time for watering

FUTURE PLANS

- Smart Phone application.
- Optimization View Ai-ML
- Remote Monitoring and Control

Gang Chart

PROJECT PLAN



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THANK YOU...