Algorithm: Wireless sensor application with adaptive duty cycling

1: Initialize Components  
2: **while** *True* **do**  
3: Get Battery Level  
4: **if** (Battery Level > Threshold) **then**  
5: Sense\_and\_Actuate()  
9: Set\_Next\_Wake\_up\_Time()  
10: **else if** (Battery Level < Threshold and Light Intensity from RAM > Threshold) **then**  
11: Sense\_and\_Actuate()  
12: Set\_Next\_Wake\_up\_Time()  
13: **else**  
14: Set\_Next\_Wake\_up\_Time()  
15: **end if**  
16: Enter low power mode  
17: **end while**

1: Sense\_and\_Actuate():  
2: Power up sensors  
3: Synchronize Time  
4: Measure T, Humidity, and Soil Moisture, and save data to RAM  
5: Get light intensity, save data to RAM  
6: Make Decision about Actuation

1: Set\_Next\_Wake\_up\_Time():  
2: **if** (Battery Level and Light Intensity from RAM > Thresholds) **then**  
3: Set wake up duration = 30 minutes  
4: **else if** (Battery Level < Threshold and Light Intensity > Threshold) **then**  
5: Set wake up duration = 1 hour //needs tuning after observation  
6: **else**  
7: Set wake up duration = 3 hours   
8: **end if**

Algorithm: Rule-Based Water Actuation System

1: **if** moisture < Threshold and light > Threshold **then**  
2: Open valve for time t // needs tuning based on experiments  
3: **end if**