

ENVIRONMENTAL MONITORING IN PARKS

INTRODUCTION:

Environmental monitoring in parks is a crucial practice aimed at preserving and protecting the natural ecosystems and resources found within these cherished outdoor spaces. Parks, whether they are urban parks, national parks, or wilderness areas, play a vital role in providing recreational opportunities, conserving biodiversity, and maintaining ecological balance. To ensure the long-term health and sustainability of these environments, it is essential to employ various monitoring techniques and strategies.

PROBLEM STATEMENT:

Despite the growing importance of environmental monitoring in parks, there are several pressing challenges and issues that need to be addressed to ensure the continued preservation and sustainability of these natural spaces. The problem statement for environmental monitoring in parks can be summarized as follows:

- ✓ *Climate Change and Environmental Impact.*
- ✓ *Insufficient Funding and Resource.*

OBJECTIVES:

- ✓ *Ecosystem Health Assessment*
- ✓ *Biodiversity Conservation*
- ✓ *Climate Change Impacts*
- ✓ *Soil and Vegetation Health*
- ✓ *Visitor Impact Assessment*
- ✓ *Emergency Response Planning*
- ✓ *Community Engagement*

METHODOLOGY:

The methodology for environmental monitoring in parks involves a systematic approach to collecting, analyzing, and interpreting data to assess the health and condition of the park's ecosystems and natural resources. Here is a general methodology for environmental monitoring in parks:

1. Define Monitoring Objectives and Goals:

- *Clearly state the objectives and goals of the monitoring program. What specific aspects of the park's environment will be monitored, and what are the desired outcomes?*

2. Select Monitoring Parameters:

- *Identify the environmental parameters to be monitored, such as water quality, air quality, biodiversity, soil health, climate data, visitor numbers, and more, based on the park's unique characteristics and objectives.*

3. Data Analysis:

- *Analyze the collected data using appropriate statistical and analytical techniques. This step helps identify trends, anomalies, and correlations.*

4. Quality Control and Assurance:

- *Implement quality control and assurance measures to ensure data accuracy and reliability. This may involve calibrating instruments, replicating samples, and cross-checking data.*

SENSORS:

- ✓ *Weather Sensors*
- ✓ *Water Quality Sensors*
- ✓ *Air Quality Sensors*

CONNECTIVITY:

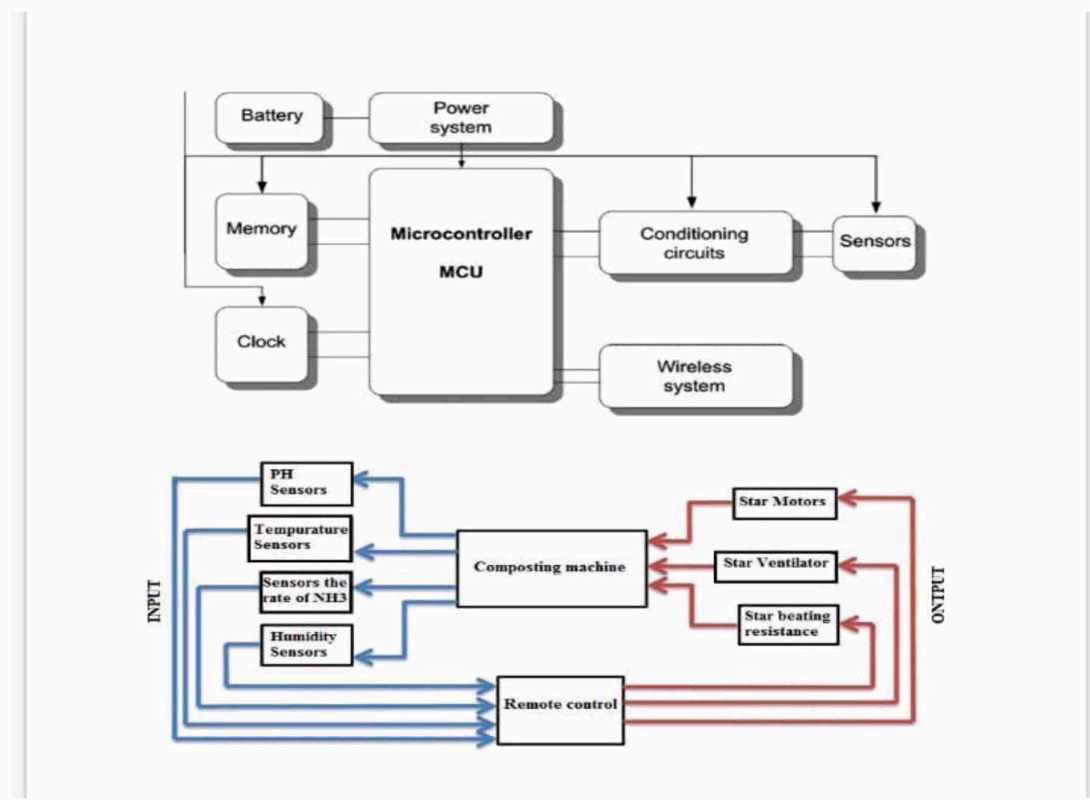
- ✓ *Wireless Sensor Network*
- ✓ *LoRaWAN.*
- ✓ *Cellular connectivity*

- ✓ *Mesh Networks*

PROTOCOL:

- ✓ *Standardized Monitoring Protocols*
- ✓ *Remote Sensing and Technology-Based Protocol*
- ✓ *Long-Term Ecological Research (LTER) Protocols*

BLOCK DIAGRAM:



SOURCE CODE:

```
#include <DHT.h>
{
#define DHT_PIN 2
#define DHT_TYPE DHT22
DHT dht(DHT_PIN, DHT_TYPE);

void setup()
{
Serial.begin(9600);  dht.begin();
}

void loop() {
delay(2000);
float temperature = dht.readTemperature();
float humidity = dht.readHumidity();

Serial.print("Temperature: ");
Serial.print(temperature);
Serial.print(" °C, Humidity: ");
Serial.print(humidity);
Serial.println(" %");
}
```

CONCLUSION:

Environmental monitoring in parks is crucial for preserving the natural ecosystems and ensuring the well-being of both wildlife and visitors. It helps in assessing the impact of human activities, tracking changes in biodiversity, and maintaining the overall health of these valuable natural areas. Regular monitoring and data collection provide the foundation for informed decision-making and sustainable park management, promoting the conservation of these essential natural resources for future generations.