Visualizing Telemetry Data of Forests on Heat Map Website

In this project, I will use different devices to collect, manage and publish data gathered from forests. Collected data will be used to visualize a real-time forest data heat-map on the real-world map. Users will be able to interact with the website. There will be three main parts of this project. The first part is the device that collects data from its environment and sends it to its master. The second one is about managing and sending data to the cloud. In this part, I will use the raspberry pi to manage data coming from slave devices. The last part is the website part. I will visualize data gathered from the forest with different categories such as; temperature, humidity, etc. Since I am a graduate student, I will be doing the project by myself. Details about each part are given below.

Details about parts:

- **Part one (Data collectors - Slaves):**
  - 3D Printed body
  - ESP32 Microcontroller (Can differ according to the project's status)
  - Various sensors. Such as; Temperature, Humidity, Pressure, etc.
  - Will send data continuously to their master via WIFI (can differ according to the project's status)
  - When not needed (master will decide), they will sleep (low-energy mode)
- **Part two (Raspberry Pi – Master):**
  - 3D printed body
  - An external power supply such as solar power (though I will not use any battery or solar power while prototyping)
  - Will manage data coming from different nodes (ESP32s-slaves). Such as organizing, storing with a good format.
  - Will send organized data with MQTT (Can differ according to the project's status)
  - Will control slaves. ON, OFF, SLEEP modes
- **Part three (Website):**
  - Will render a heat map on the real-world map with collected data
  - Nodes control will be decided by user activity on the website
  - I will probably use the Javascript library to create heat-map