MAKE Labs
POWERING PROGRESS

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makelabs

For Establishing a Research & Development Centre

Dear,

Proposed System (Tanglish)

Indha proposed system-la, isolated Amazon communities-la renewable energy systems-a easy-aa manage panna oru smart solution propose pannrom. Indha system-la Distributed Energy Resource Management System (DERMS) use pannrom, which allows urban area-la irukkura experts remote-aa energy systems monitor and control panna.

Connectivity improve panna Low Power Wide Area Network (LPWAN) use pannrom. Specifically, LoRa technology use pannrom because idhu long range communication, low power consumption, and forest area conditions-ku suitable. Renewable energy sources (solar panels, batteries) kitta LoRa-enabled sensor nodes install pannrom. Indha nodes temperature, humidity, power generation, and battery status maadhiri data collect pannum.

Collected data LoRa gateway moolama cloud server-ku send pannum. Cloud-la data analyze pannitu, Android / Web dashboard moolama operators energy usage, faults, and performance monitor panna mudiyum. Weather conditions impact panninaa, system alert send pannum.

Indha proposed system low maintenance, cost effective, and rainforest conditions-la reliable-aa work aagum, which helps sustainable energy management in remote communities.

Secure Algorithms Used in the Proposed System

Algorithm Name	Purpose	Usage in Proposed System	Advantages

AES (Advanced Encryption Standard)	Data Encryption	Sensor data encrypt pannitu LoRa network moolama transmit pannum	High security, fast, low power consumption
SHA-256	Data Integrity & Hashing	Data change aagiducha-nu	Secure, reliable, collision
HMAC	Authentication	Sender and receiver authentication-ku use pannum	Prevents data tampering RSA Secure Key Exchange Encryption key secure-aa share panna use pannum Strong security, widely used ECC (Elliptic Curve Cryptography) Lightweight Key Exchange Low-power IoT devices-la secure communication Less memory usage, energy efficient