SMART AGRICULTURE USING LoRa

4 Transmitter Nodes + 1 Receiver Gateway + Cloud Upload

Quantities Doubled for Full Deployment

Component	Model	Qty	Purpose
CORE ELECTRONICS			
ESP32-C3 Dev Board	ESP32-S3	**10**	8 TX + 2 Gateway
LoRa Module	SX1262 (E22-900M22S)	**10**	Communication
Antenna (SMA 5–9dBi)	868 MHz	**10**	Long range transmission
SENSORS (PER NODE ×8)			
Soil Moisture Sensor	Capacitive v1.2	**8**	Soil condition
Temp + Humidity	SHT31	**8**	Weather monitoring
Light Sensor	BH1750	**8**	Sunlight measurement
Rain Sensor	Rain module	**8**	Rain detection
Water Level Sensor	Float / Analog	**8**	Tank level monitoring
Air Quality (opt.)	BME680	**8**	Air monitoring
POWER SYSTEM			
Battery	LiFePO4 18650 2000–3000mAh	**8**	Each TX node
DC-DC Converter	TPS63020 / MP1584	**8**	Stable 3.3V output
Charging Module	TP4056 / LiFePO4 charger	**8**	Battery charging
⚡ POWER STABILITY & CONTROL			
Electrolytic Cap.	1000µF	**10**	LoRa power stability
Ceramic Capacitor	0.1µF	**10**	Noise filtering
MOSFET	AO3400 / IRLZ44N	**8**	Sensor power control
TVS Diode	SMBJ5.0A	**8**	Surge protection
GATEWAY POWER			
Power Adapter	5V 2A	**2**	Gateway power supply
OPTIONAL — SOLAR CHARGING			

Component	Model	Qty	Purpose
Solar Panel	5V 1–3W	**8**	Outdoor charging
TOTAL UNIQUE LINE ITEMS		**21**	**Smart Agriculture LoRa Network**