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WIRELESS WATER MANAGEMENT SYSTEM USING LORA

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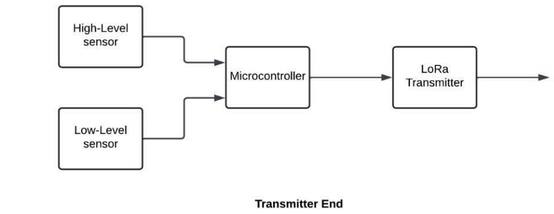
Abstract: This water tank management system utilizing LoRa technology enables real-time monitoring and management of water levels at a lower cost than conventional methods, aiding in optimizing water supply planning, mitigating shortages, and curbing wastage through timely visualization and alerts. Supported by a rural case study, its effectiveness across diverse sectors is highlighted, including agriculture, industries, urban areas, and domestic settings. Leveraging LoRa technology, the system offers a scalable and energy-efficient solution for addressing common water management challenges such as overflow and ensuring a sufficient water supply. This innovative system promotes efficient water usage, contributing significantly to sustainable water resource management efforts, and empowering stakeholders to advocate for responsible practices and participate in water conservation.

Introduction:

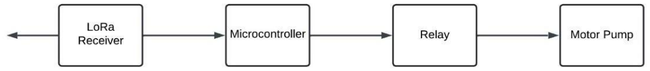
The Wireless Water Management System with LoRa technology is a smart solution for managing water effectively. Using LoRa, it connects water tanks, sensors, and a central system to monitor water levels in real-time. This helps prevent overflow or shortages. The system is made up of components like microcontrollers, transceivers, and sensors, chosen for their reliability and affordability. They work together to collect, send, and analyze data about water levels, allowing for informed decisions. It's versatile and can be used in agriculture, industries, cities, and homes.

For example, in farming, it helps optimize irrigation by providing data on soil moisture and weather. In cities, it detects leaks in water pipes to reduce waste. Easy to scale and energy-efficient, this system is suitable for both rural and urban areas. Case studies show its effectiveness in saving water and improving management. Overall, it's a simple yet powerful tool for conserving water resources and ensuring a steady supply for everyone.

Simulated Designs:



Transmitter End



Receiver End

Results:

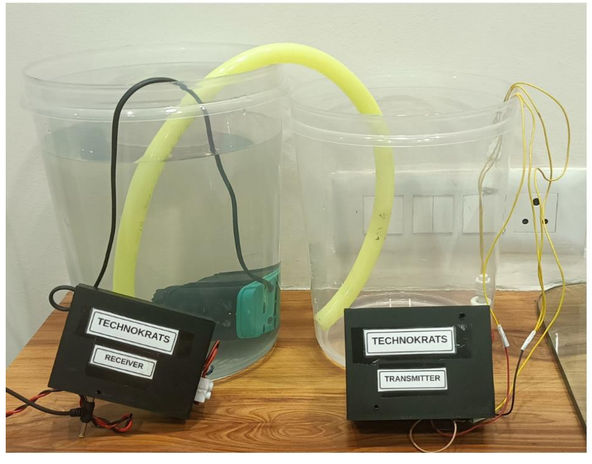


Figure. When water level is low

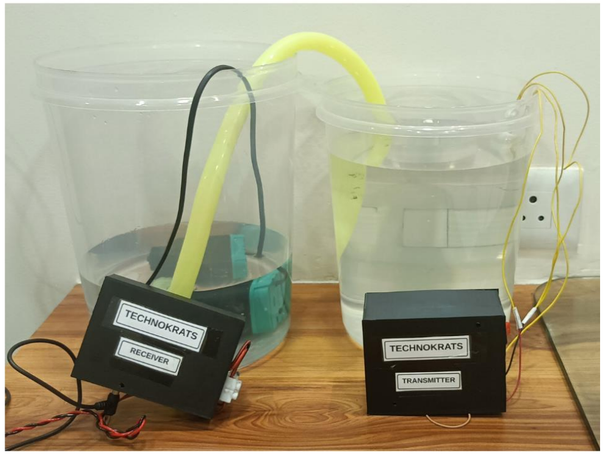


Figure. When water level is high

Conclusion:

The water controller system presents a significant advancement in water management practices, offering precise control and monitoring capabilities. By harnessing LORA technology, the system enhances resource allocation, conserves water, and promotes sustainable irrigation practices. Further refinements and integration with smart sensors promise even greater efficiency and environmental conservation in water distribution systems.

Future Scope:

In the future, water management with LoRa technology promises to revolutionize how we monitor and manage water resources. LoRa enables networks of small sensors to communicate over long distances, providing real-time data on water levels, quality, and flow. As technology advances, these sensors will become smaller and more affordable, facilitating deployment even in remote areas. This has the potential to greatly benefit communities lacking access to clean water, as it allows for remote monitoring of water quality, aiding in environmental protection. Overall, the future of water management with LoRa technology holds great promise for improving access to clean water and ensuring environmental sustainability through innovation and collaboration.

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