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SMART WATER MANAGEMENT

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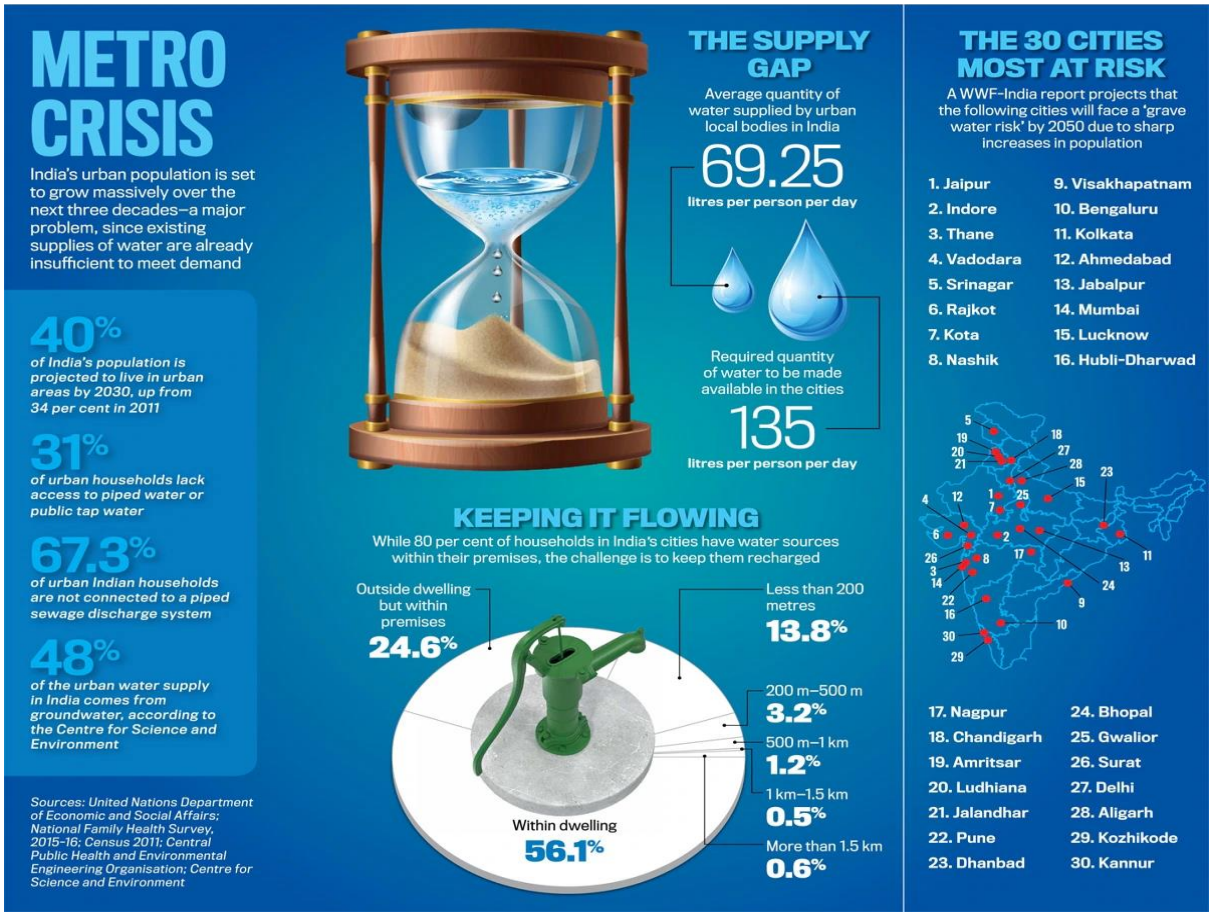
OBJECTIVE:

The objectives of smart water management encompass a range of goals and strategies aimed at optimizing the use, conservation, and quality of water resources in the parks and garden. Many people uses tap waters, bathrooms and pipes. It also helps in developing society while enhancing overall efficiency and sustainability.

REPORTS AND ARTICLES:

Delhi has more than 16,000 parks big and small gardens are maintained by the Municipal Corporation of Delhi (MCD), New Delhi Municipal Council and Delhi Development Authority, besides the lawns around all major heritage monuments under the Archaeological Survey of India (ASI).

Chandigarh has a large number of open spaces, parks, gardens and houses of one canal and above in where water is required to irrigate the spaces. Most of these are currently using potable water, which affects drinking water requirement of the city.



water usage in cities

DESIGN FRAMEWORK:

Smart water management is an innovative IoT-based solution designed to optimize water consumption in public parks and gardens using ESP32-powered devices. It leverages cutting-edge technology, real-time data analysis, and user-friendly interfaces to promote sustainable water management and environmental responsibility in urban green spaces.

Components and Features:

1. ESP32-Powered Devices:

- ESP32-based IoT nodes strategically placed throughout the park or garden, equipped with sensors for soil moisture, weather conditions, and water flow.

2. Wireless Connectivity:

- Seamless Wi-Fi or LoRa connectivity for reliable data transmission between devices and a central server.

3. Real-time Data Collection:

- Continuous monitoring of soil moisture levels, local weather data, and water consumption, providing a holistic view of environmental conditions.

4. Data Analytics and Machine Learning:

- Advanced data analytics and machine learning algorithms that process collected data to predict optimal irrigation schedules, factoring in weather forecasts and historical patterns.

5. Smart Irrigation Control:

- An intelligent irrigation system that adjusts watering schedules in real-time based on sensor data, preventing over-irrigation and ensuring plants receive the right amount of water.

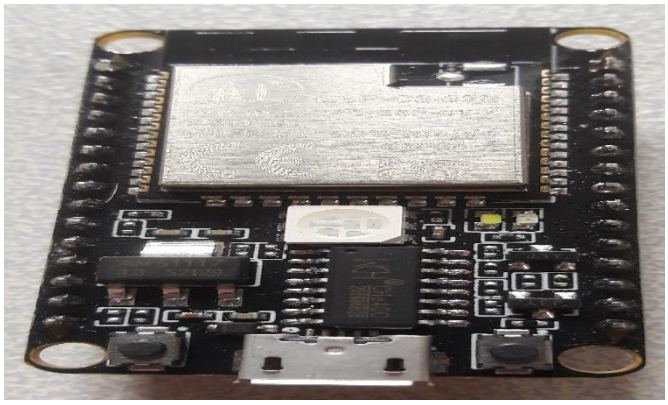
6. User-Friendly Dashboard:

- A web-based or mobile app dashboard for park managers and maintenance staff to visualize data, monitor device health, and access insights for informed decision-making.

IoT DEVICE DEVELOPMENT:

ESP32 development board

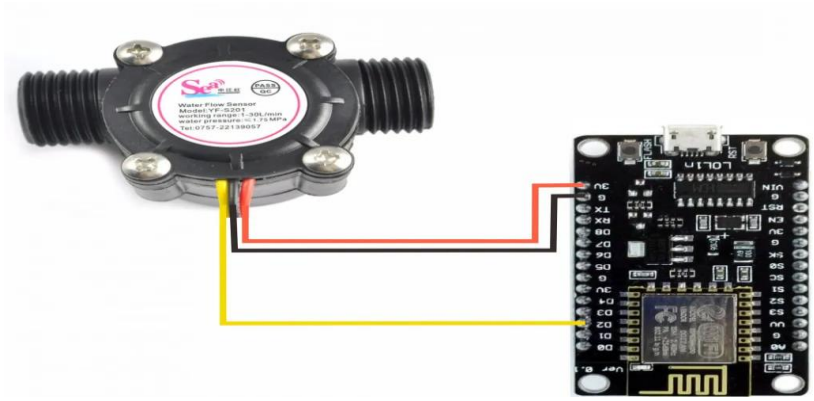
It is a versatile microcontroller with built in Wi-Fi and Bluetooth capabilities, making it an ideal tool for developing new applications. This system provides a high level of security and privacy protection, as well as a low-cost solution to the installation of sensors and monitoring devices.



ESP32 processor

Sensors

The YF-S201 is the water flow sensor works on Hall Effect principle that can be used to monitor the flow of water help you determine if your water supply is running at optimal levels. It is also a great way to track water usage, which has working range of 1-30L/min. The size is 1/2 BSP which is enough for water usage in parks and garden. We can also use different based on the size of the water supply. This will save us time and money by saving energy.



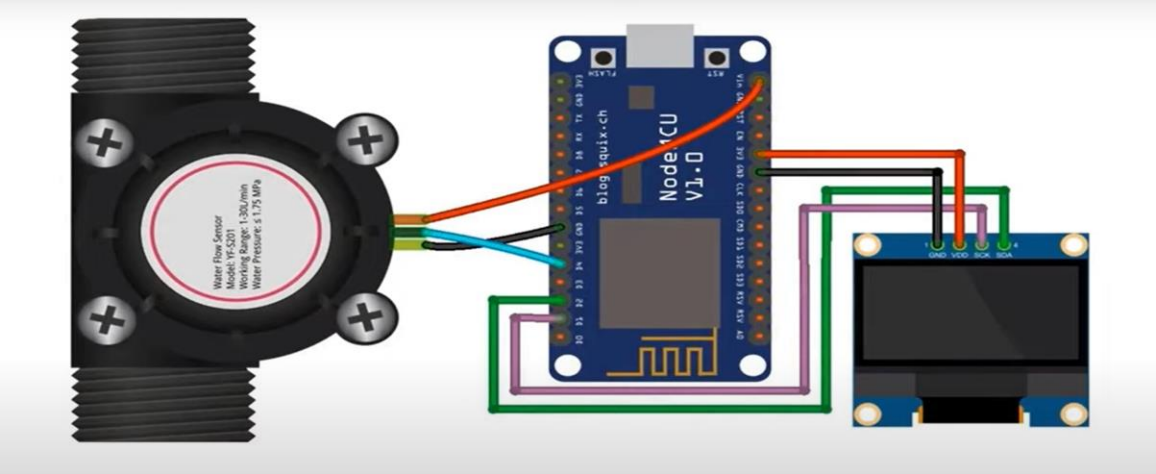
YS-S201 sensor with ESP32 processor

Power supply

The stable power supply should ensured for ESP32 and sensors. Battery powered solution are possible, but they needed to replaced periodically. Considering power efficiency, we can use ac supply from the power lines or we can use power from solar panel placed in lights in the parks and garden.

Enclosure

The electronic components should be protected from environmental factors with weatherproof and suitable for outdoor use.



CONCLUSION:

The implementation of our innovative IoT-based water optimization Smart Water Management Management represents a significant step towards addressing the critical challenges associated with water consumption in public spaces, particularly parks and gardens. Throughout the course of this project, we have endeavoured to design and deploy a solution that not only reduces water waste but also promotes environmental responsibility, cost-efficiency, and operational excellence.

Our comprehensive approach to water management, driven by cutting-edge technology and data-driven insights, has yielded several noteworthy outcomes. These outcomes include substantial reductions in water consumption, resulting in immediate cost savings for municipal budgets. Moreover, the environmental benefits extend to the preservation of local ecosystems, contributing to the long-term ecological health of the communities we serve.

Our commitment to data-driven decision-making has empowered park managers and maintenance teams with the tools and knowledge needed to optimize water resources efficiently. The real-time monitoring capabilities, intelligent irrigation control, and user-friendly interfaces have streamlined the management of public spaces, enhancing the experience for visitors and ensuring the sustained beauty and functionality of our urban greenspaces.

As we look forward, the success of Smart water management underscores the significance of leveraging technology and innovation to address pressing environmental and resource management challenges. The adaptability and scalability of our solution pave the way for its expansion into other public spaces and regions, contributing to a broader movement towards sustainability and responsible resource utilization.

In closing, "Smart Water Management" stands as a testament to the potential of interdisciplinary collaboration, cutting-edge technology, and a commitment to environmental stewardship. We are proud to have played a role in fostering a more sustainable and efficient future for our urban greenspaces, and we remain dedicated to advancing the cause of responsible water management and conservation.