



Carroroe Rainwater Harvesting

CADRA - CLIMATE ACTION & SUSTAINABILITY COMPETITION

APRIL 2024

Who We Are

We are a dedicated team of students pursuing our Master's degree in UX Design and Applied Innovation at ATU.

Comprising Geraldine, Louise, Martin, Savena, and Steven, our diverse backgrounds and shared passion for innovation unite us in our pursuit of impactful solutions.

Our journey into the Candra Climate Action and Sustainability Student Competition began with our exploration of the problem statement: "How might we empower communities to use AI to tackle the local challenges of climate change?"

Through our coursework in the first module of the UX and Design Course at ATU, we identified this competition as an opportunity to apply our knowledge and skills to address real-world environmental challenges.

Our Approach

We took a holistic approach, driven by innovation, community engagement, and sustainability. Through research and collaboration, we developed user-centered solutions, integrating AI to optimise functionality and efficiency. Our designs prioritise collaboration with local stakeholders, fostering community ownership. Our goal is not just a rainwater harvesting system but lasting, impactful change.

Recognizing the complexity of the water scarcity challenge, we developed two distinct solutions aligned with the competition's objectives. The first solution involves repositioning a new harvesting system to enhance accessibility and convenience:

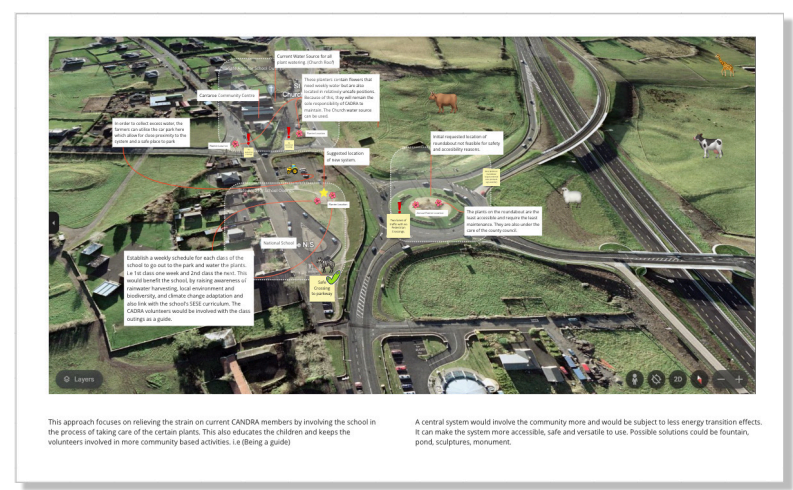
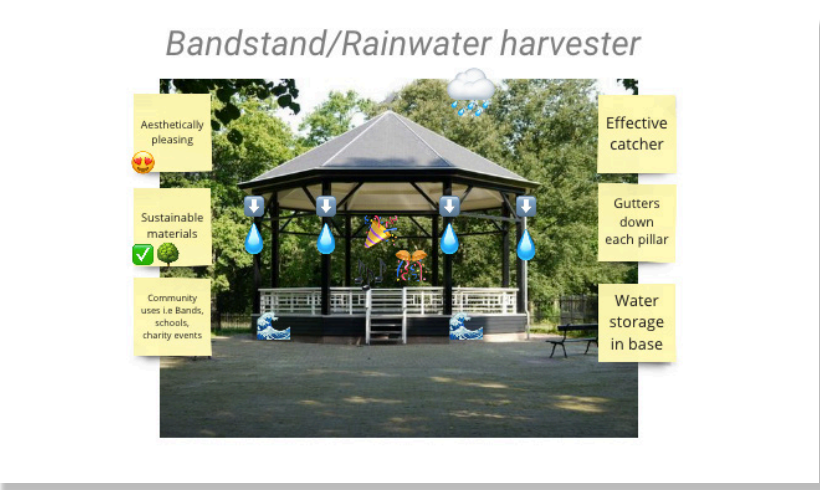
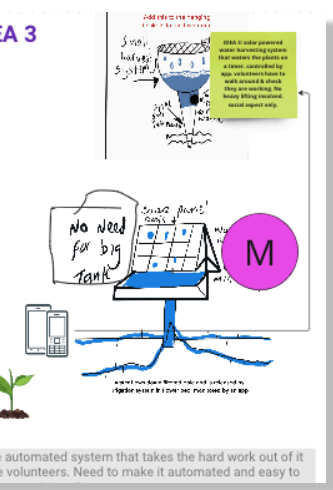
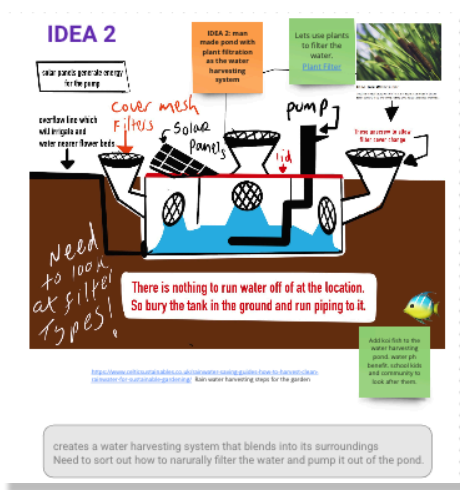
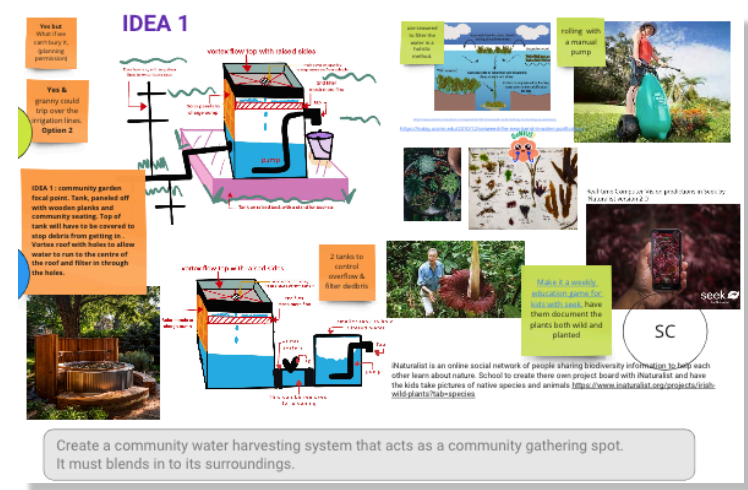
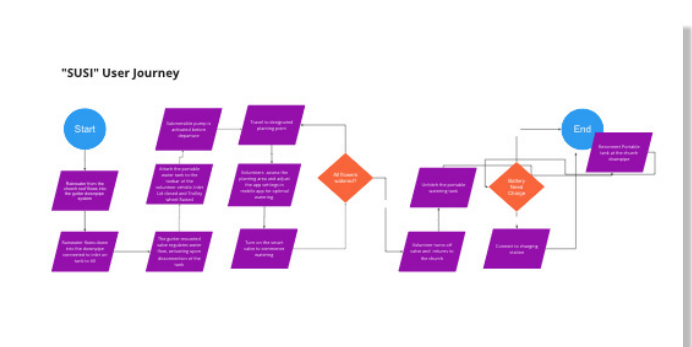
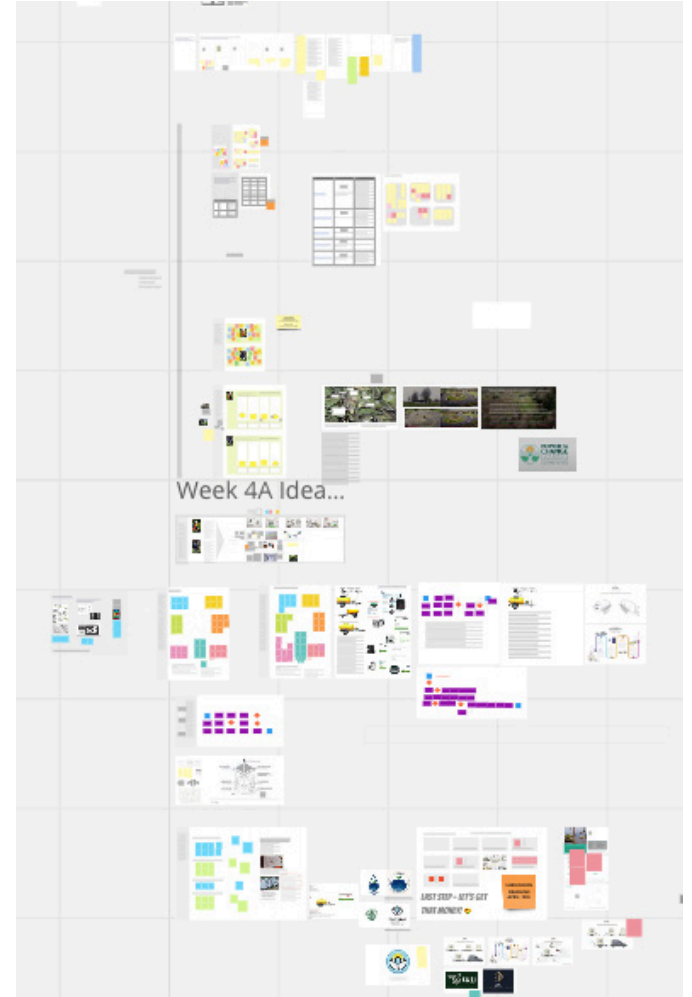
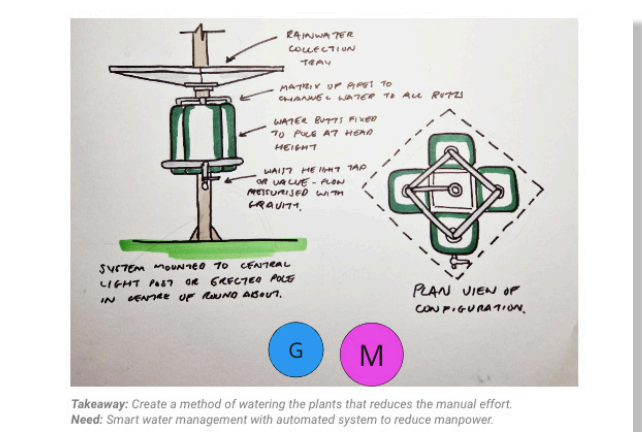
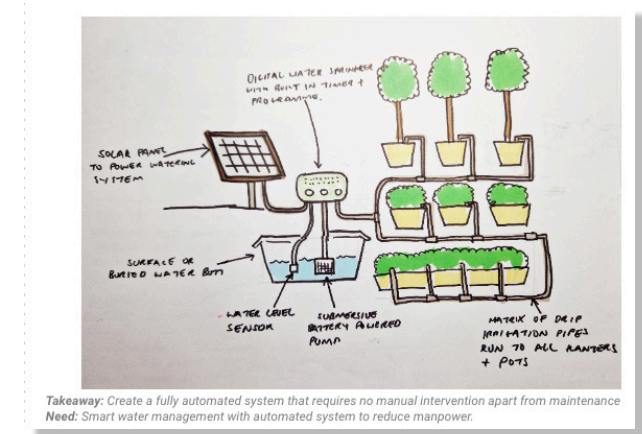
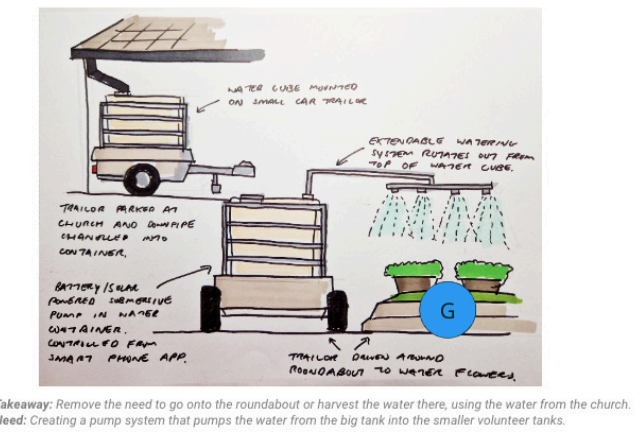
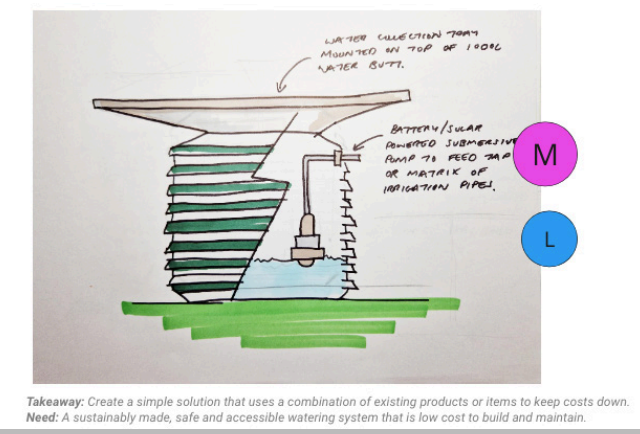
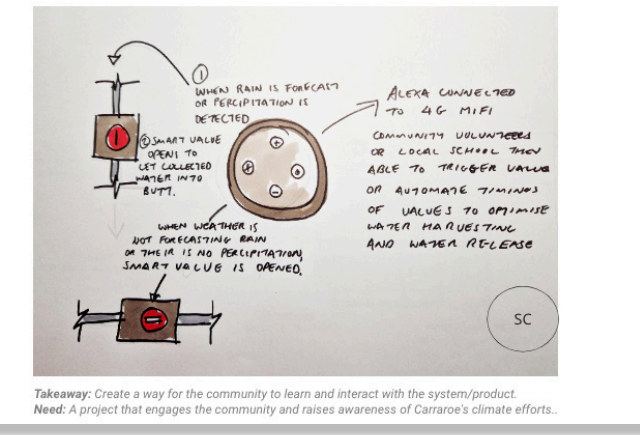
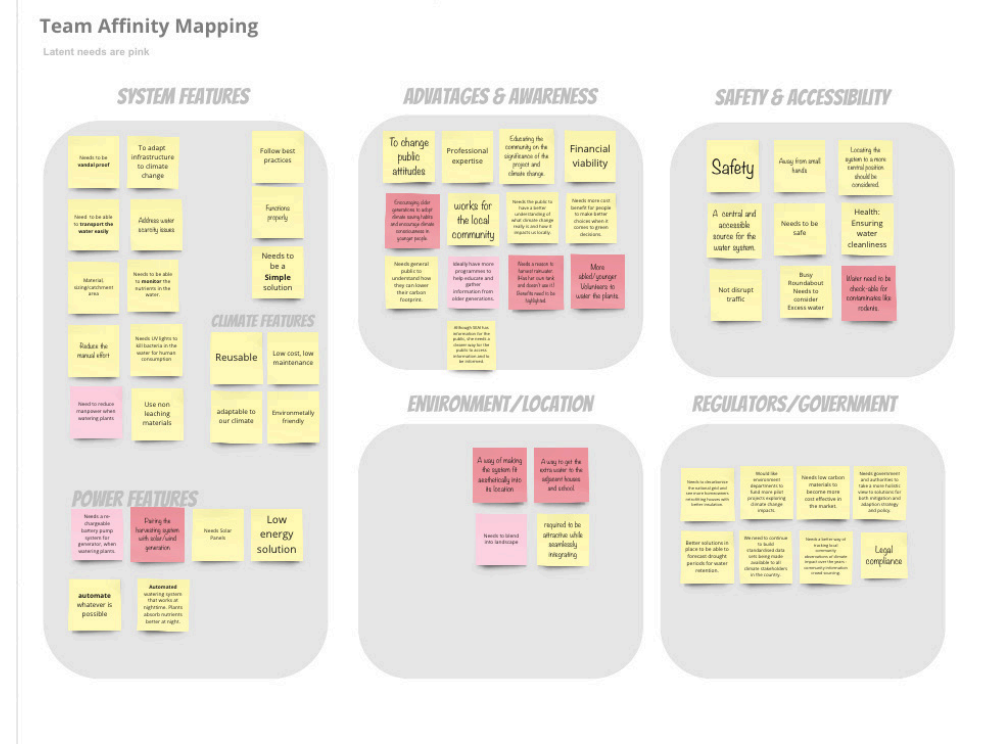
Rain Well: Strategically positioned in the central park area, providing a permanent solution for rainwater harvesting.

The second solution focuses on enhancing the existing system at the church, adhering to the principle of "If it isn't broken, don't fix it":

Mobile Water Trailer: Utilizing a mobile unit stationed at the church, facilitating water distribution throughout the community.

Our solutions seamlessly integrate AI technologies to empower the Candra community in combating climate change, reflecting our commitment to creating meaningful and sustainable impact.

Our Initial Concepts



Option A

Carraroe Community Well.

A permanent feature which draws attention to the work of Carraroe's volunteers and encapsulates the spirit of the community

Complements the current landscape

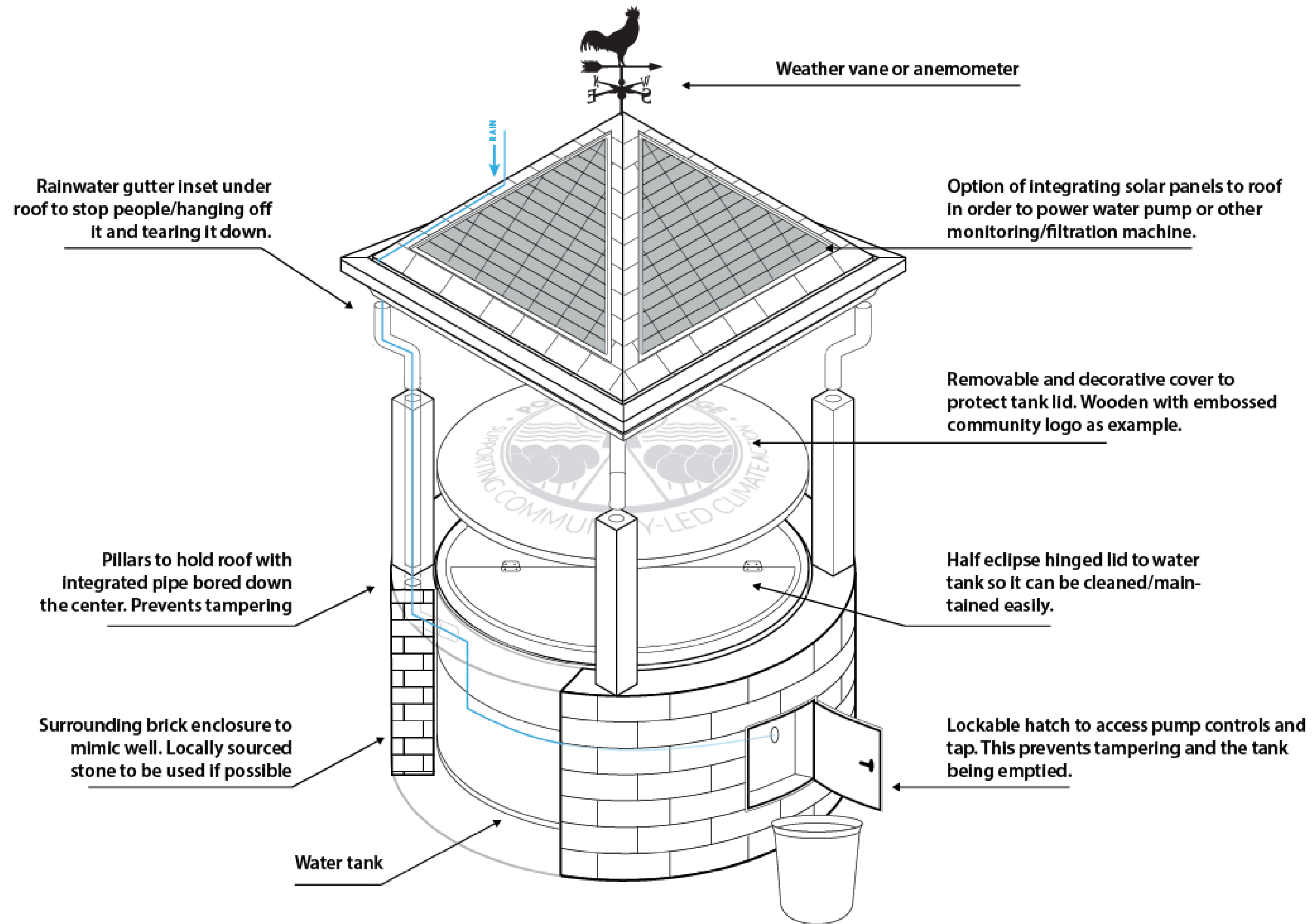
Improves ease of access

An efficient rainwater collection system with the traditional appearance of a well

Knapsacks will minimise spillage, ensure easier transportation and allow for even distribution of water on the flowers.

Raise awareness of the issue of water conservation.

In the following slides, we will outline the details of the design and how it could be implemented in practice.





Option B

S.U.S.I

The Sustainable Urban Sprinkling Irrigator (SUSI) is an innovative design concept aimed at empowering community volunteers to efficiently water community plants while minimising manual labour. At its core, the trailer integrates a rainwater harvesting system, comprising of a collection storage tank, a battery-powered pump and smart valves for automated water distribution and pressure control.

The system begins by collecting rainwater from the existing rainwater collection point at the church, utilising a network of gutters and downspouts to direct the flow into an IBC tank. This tank is equipped with a filtration system to ensure water quality and is sized to accommodate significant rainfall events. A battery-powered pump is utilised to extract water from the tank, providing the necessary pressure for irrigation.

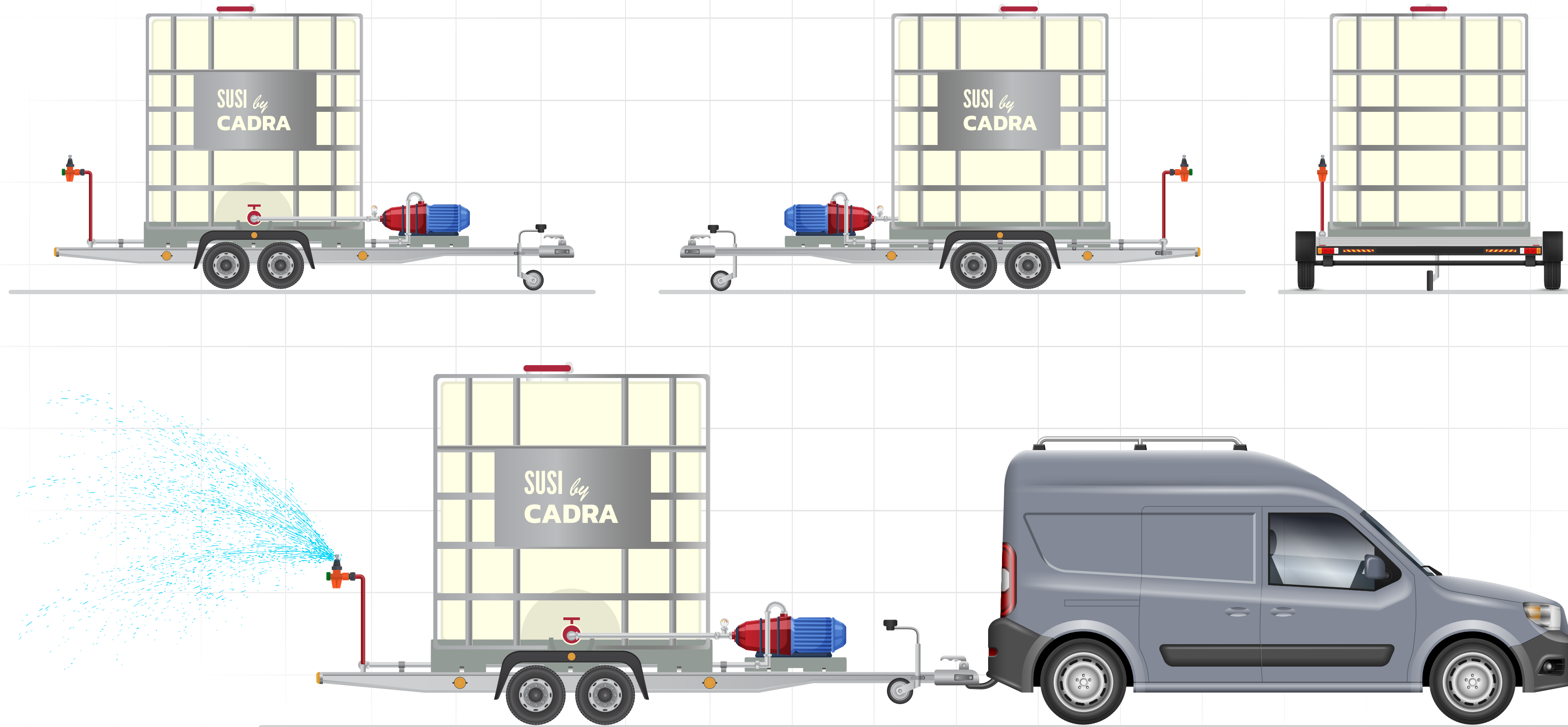
Smart valves integrated into the system allow for precise control over water distribution, ensuring optimal watering levels for community plants. These valves can be programmed to operate effectively on types of plants being watered and whether they are bedding plants, hanging pots or large shrubs. Simply controlled from a mobile phone app, there is no need for manual intervention from users apart from connecting the trailer to a vehicle. This can be done by either members of the Cadra group or the local County Council using their vehicles.

By harnessing rainwater and automating the irrigation process, the SUSI offers several benefits. Firstly, it reduces reliance on traditional water sources and capitalises on the existing harvesting system, promoting sustainability and conservation. Secondly, it minimises the need for manual labour, freeing up volunteers to focus on other community initiatives. Additionally, the system's smart technology optimises water usage, leading to healthier plants and greater overall efficiency in community gardening efforts. Overall, the SUSI represents a scalable, cost-effective and user-friendly solution for sustainable water management in community gardening projects.

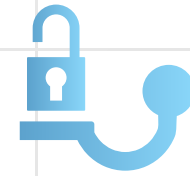
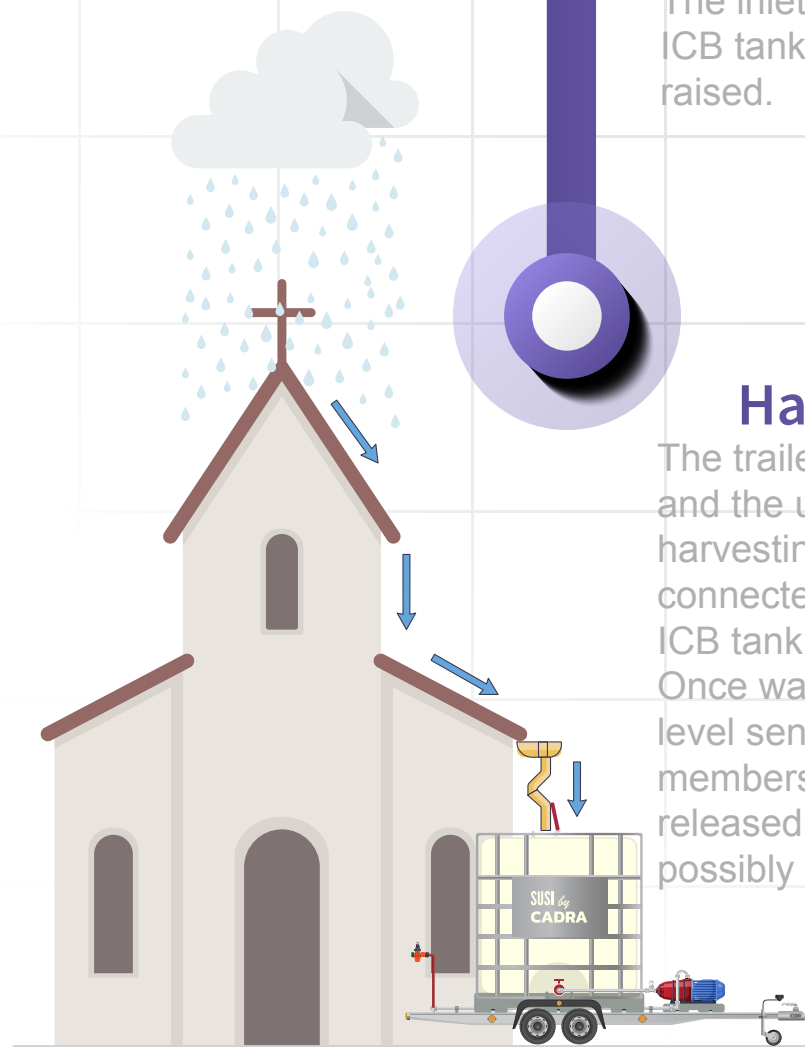
SUSI



SUSTAINABLE URBAN SPRINKLING IRRIGATOR

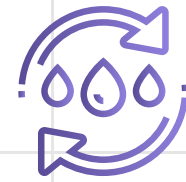


SUSI USER JOURNEY



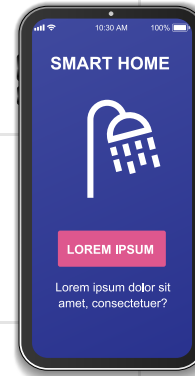
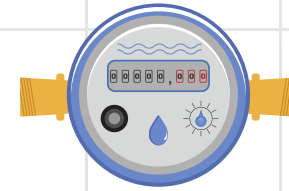
Attach Trailer

The users then hitch the trailer onto a vehicle with a towbar. The rainwater pipe is then redirected to the water butt temporarily. The inlet lid is then closed on the ICB tank and the trolley wheel raised.



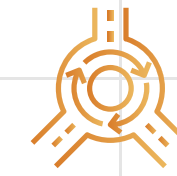
Harvest Water

The trailer is parked at church and the upgraded water harvesting down pipe is connected to the top inlet on the ICB tank to fill from rainwater. Once water level is reached, a level sensor notifies smart app members and excess water released through overflow - possibly to existing water butt.



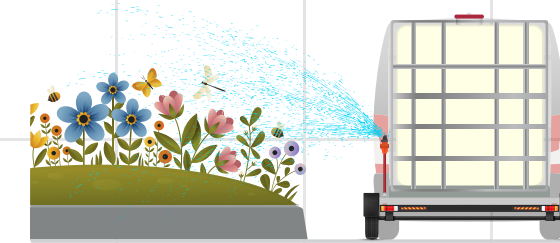
Smart Connection

The battery operated electric pump is then activated and pressure valve checked. The user then connects their mobile device to the smart valve via the Smart Things app. User then checks that valves are opening correctly and water flow is as expected. Adjust spray nozzle if needed and then turns off valve for transport.



Water Roundabout

Once the vehicle and trailer reaches the roundabout, the user uses their smart phone app or voiceactivation to turn on the smart wifi valve to commence watering. The vehicle is then driven around the roundabout to sprinkle water onto flower beds and shrubs. Once sufficient watering is done, the user turns off the valve again via the app or voiceactivation.



Water Street Planters

The vehicle then continues to drive around the community and when they come upon any shrubs, planters or flowers that need watering, they activate the pump. If there is hard to reach or hanging baskets, an optional hose pipe can be manually used by volunteers activated by a secondary smart valve.



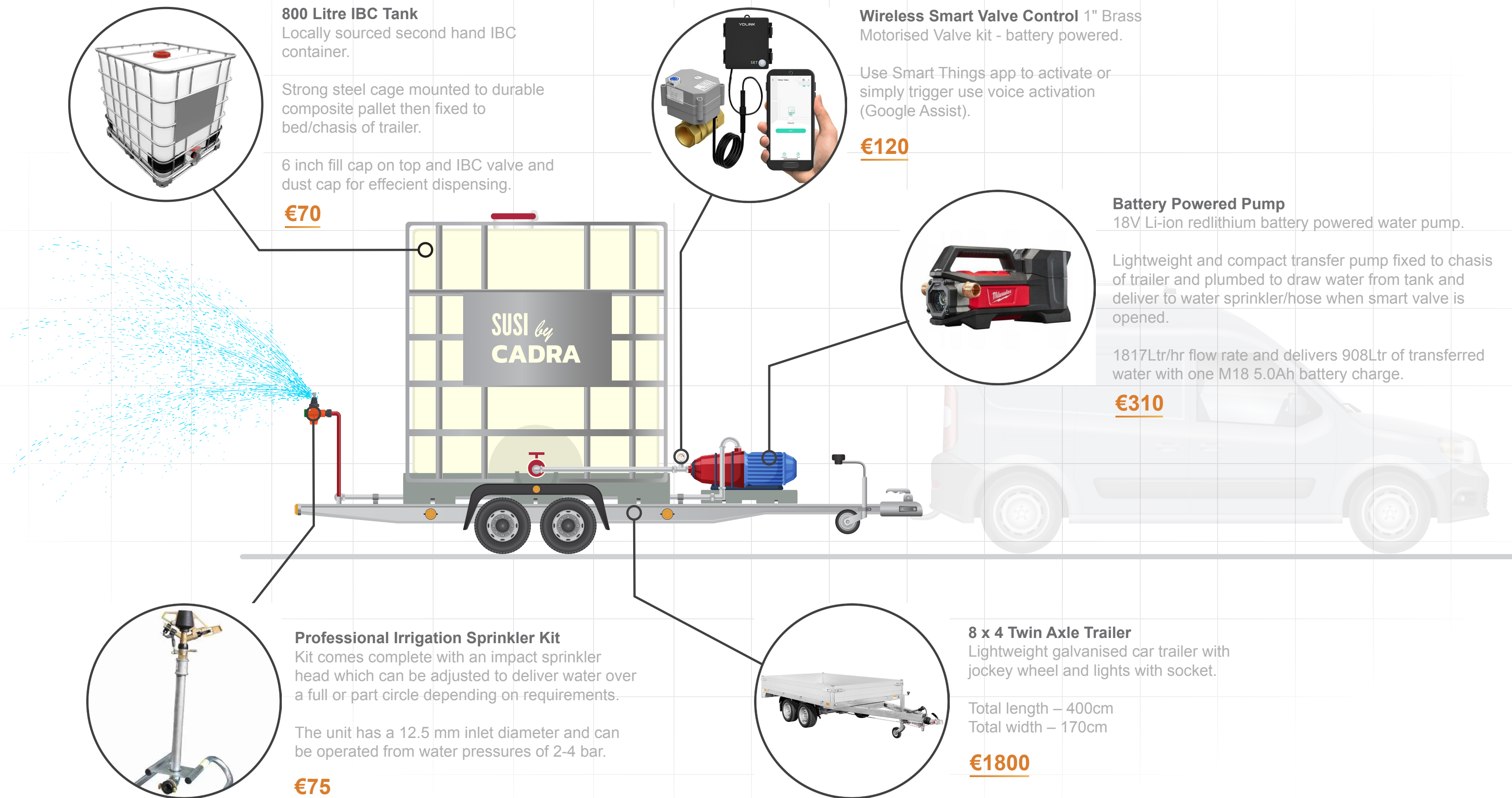
Finish

Place trailer back at church, turn off pump, disconnect from vehicle, reconnect water harvesting pipe from church downpipe.

SUSI



SUSTAINABLE URBAN SPRINKLING IRRIGATOR



Approximate Total Cost: **€2400**



SUSI

SUSTAINABLE URBAN SPRINKLING IRRIGATOR
carraroe & District Regeneration Association



SUSI
by CADRA

SUSTAINABLE URBAN SPRINKLING IRRIGATOR

