

# CED Rainwater Harvesting Frequently Asked Questions



Tank Structure .....	1
Mortar.....	1
What is the mixture of cement and sand? .....	1
How do I repair a leak? .....	1
What is the carbon footprint of a cement tank?.....	1
Tap Twinning.....	2
Why harvest rainwater with cement tanks? .....	2
Advantages of the Pumpkin Tank: .....	2
When will I receive my fridge magnet?.....	3
What is the exchange rate for GBP to TSH? .....	3
How much does it cost to build a tank? .....	3
How big a tank do I need?.....	3
Is the water clean enough to drink? .....	3



## Tank Structure

Mortar

What is the mixture of cement and sand?

1 part cement to 3 parts sand.

How do I repair a leak?

What is the carbon footprint of a cement tank?

I'd love to know the answer to that, particularly in relation to other solutions like plastic tanks or pipework distribution to households. If you have an answer, let us know!

## Tap Twinning

### Why harvest rainwater with cement tanks?

1. The technology is proven over many years.
2. Tanks are robust and last indefinitely.
3. Rainwater stored in tanks remains fresh and can be drunk with little risk, though we recommend boiling or “SODIS” treatment for children.
4. The water remains cool.
5. There is a government push towards rainwater harvesting in many countries as a means of reducing demand on municipal water infrastructure
6. This is fed, in part, by the Sustainable Development Goals (Goal 6A) that promote rainwater harvesting (RWH).
7. Local partners appreciate that ferro-cement technology creates local jobs and keeps money in the community rather than going to corporations elsewhere as with plastic tanks.
8. Local partners appreciate the robustness of ferrocement.
9. In most instances the cost of a ferrocement tank is less than that for a plastic tank. The difference is more marked away from major centres where there are plastic tank factories.
10. In remote locations it is easier to transport materials (e.g. by bicycle) than to transport a completed tank.
11. There is an emerging middle class in most towns who are looking for better ways to store water.
12. Climate change means that water supplies are more erratic so that storage is becoming more important. The Sustainable Development Goals (Goal 6A) promotes rainwater harvesting (RWH).
13. Aquifers are being exhausted near urban areas due to over-extraction, forcing people to look elsewhere.
14. Increasing population density is putting pressure on municipal piped water supplies; authorities are encouraging people to collect rainwater to reduce pressure on over-stretched systems.

### Advantages of the Pumpkin Tank:

1. The tank is attractive; (in Kamembe, Rwanda someone asked if it was an art installation!).
2. The double curve distributes stresses more evenly. This is particularly important where the base meets the tank wall.
3. There is a generous factor of safety; double curve tanks of up to 4000 litres can be built without wire reinforcement (Watt, “Ferrocement Water Tanks”, 1978, p62).
4. The skeleton framework is easily manufactured locally and can be transported by bicycle.
5. Cement shell tanks are robust compared to plastic or steel tanks.
6. Cement shell tanks last much longer than plastic or steel tanks.
7. Cement shell tanks are easy to repair should a leak develop.
8. Cement shell tanks are heavy and difficult to move and therefore difficult to steal.
9. Cement shell tanks are economical to build.
  - a. Low cost of materials due to thin walls.
  - b. It should be possible to find an engineer to look at the design and advise on whether a reduction of chicken wire would be appropriate or whether simple wire reinforcement would be adequate.
  - c. Whilst building tanks is a “specialist skill” it is easily learned.
  - d. Costs compare favourably against plastic tanks.

- e. Building on site means that money stays in the community rather than being paid to city factories.
- 10.

### When will I receive my fridge magnet?

We aim to deliver a fridge magnet within 21 days of you providing your address.

### Can I visit the person with whom my tap is twinned?

We regret that this would not be desirable. There are various risks around exploiting vulnerable people, building dependency, etc. However, if you'd like to see the project more generally – we could introduce you to families who have built tanks and show you how they are made – please contact CED.

### What is the exchange rate for GBP to TSH?

On 21/1/24 the exchange rate was 3,180 Tsh to the £.

### How much does it cost to build a tank?

This varies depending on location. As well as materials costs and labour charges, there are logistics costs and supervision costs to consider. For this reason, although we estimate a 1000 litre tank to cost around 370,000 Tsh, CED grants 420,000 to our partner to include overheads when the tank is being given to a vulnerable person.

A 5,000 litre tank is estimated to cost 1,200,000 Tsh. CED offers a grant of 1,000,000 Tsh to institutions like churches and schools.

A 10,000 litre tank is estimated to cost 1,700,000 Tsh. CED offers a grant of 1,500,000 Tsh to institutions like churches and schools.

### How big a tank do I need?

Our friends at SamSamWater have designed a tool which allows you to calculate storage requirements based on rainfall and roof area. You can find it on

<https://www.samsamwater.com/rain/>

### Is the water clean enough to drink?

Rain from the sky is clean! Unfortunately, before it reaches the tank it runs down a roof on which birds have pooped and dust has gathered. For this reason books recommend the inclusion of a “first flush diverter” to catch the initial 10mm of a shower and divert it away from the tank. These, however, tend to be expensive and complicated. CED used a pipe with a stopper on the end but even this caused problems and was accepting very little water before it was full. We therefore rely completely on a mosquito wire sieve and a charcoal filter to offer some basic protection.

One study found that tank water is comparable in cleanliness to that fetched from protected rural point sources, averaging faecal coliform counts around 10 per 100ml which is just about WHO “low risk”.

If the tanks is kept sealed to prevent mosquitos and vermin and kept dark to prevent the development of e-coli, the water actually becomes safer to drink with time.

We therefore ask for caution when drinking and encourage people to boil or use the “SODIS” decontamination method for water for their children.

In the long term we plan to start testing the water in a sample group of tanks.

