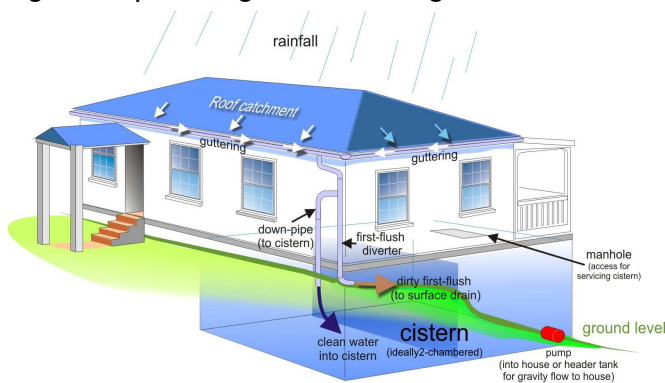


Rainwater Harvesting in the Caribbean

RWH Technical Fact Sheet 5A: Typical domestic RWH system configurations

Below-ground storage

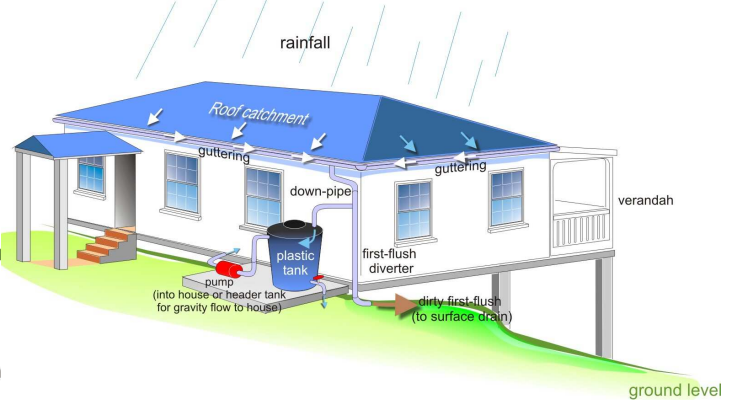
The storage (or cistern) is typically located below the building structure. This option is relatively more expensive and can account for a significant percentage of the building costs.



Below-ground cistern

Above-ground storage

The tanks are situated in close proximity to the building. This option is relatively cheaper on account of the costs of the tanks which are commonly made from plastic. There is the flexibility of adding more tanks depending on the water requirements and affordability.



ground level

A 'header' tank can also be incorporated into the designs. The water from the cistern may be pumped to an elevated tank (or header tank) to allow the water to flow into the house via gravity. This reduces the need for constant pumping when the water is being used.

Advantages and disadvantages of aboveground and underground storage systems (source: SOPAC, 2004)

	Advantages	Disadvantages
Underground	<ul style="list-style-type: none"> Surrounding ground lends structural support allowing lower wall thickness and lower installation costs Can form part of the building foundation Unobtrusive - require little or no space above ground; useful where large volume storage is required 	<ul style="list-style-type: none"> For relatively small storage requirements, is relatively more expensive Water extraction is more problematic, requiring a pump Leaks or failures are difficult to detect; pose risk to building foundation failure if constructed on a slope Possible contamination of the tank from groundwater intrusion or floodwaters Possibility of undetected structural damage by tree roots; allows for entry of contaminants or vermin Cannot be easily drained for cleaning; requires pump-out
Above-ground	<ul style="list-style-type: none"> Allows for easy inspection for cracks (masonry structures) or leakage Cheaper to install and maintain; particularly the case for small volume household supply needs Water extraction can be done by gravity with extraction by tap; allow for easy draining if needed Tank(s) can be raised above ground to increase water pressure 	<ul style="list-style-type: none"> Requires space for installation, particularly if large storage volume is needed; case for commercial and industrial use Masonry works exposed to deterioration from weathering Failure of elevated support structures can be dangerous Requires the construction of a solid foundation which may be costly

Collaborative production between the Caribbean Environmental Health Institute and the United Nations Environment Programme



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Rainwater Harvesting in the Caribbean

RWH Technical Fact Sheet 5B: Main RWH components

- 1. Catchment area:** Commonly a roof surface or pavement. Concrete pavements are used for multiple-user community systems and can have applications for agricultural or commercial uses with large water requirements.
- 2. Conveyance system:** Network of guttering and pipes to transfer the rainwater from the catchment to the storage tanks. This consists of connections to one or more down-pipes connected to the roof gutters. A key component of the conveyance system to improve the cleanliness of the harvested water is a 'first-flush device' that diverts the dirtiest roof-water away from the storage tank.
- 3. Storage device:** A tank situated above or underneath (cistern) the ground.
- 4. Distribution system:** In the most basic case, this can be simply a container to extract the water from the storage tank or a pipe functioning solely as an outlet. For a household this will be the piping network that supplies the building with the harvested water. For a community system, this could be a single outlet pipe or a complex network of pipes serving multiple users. Pumps may be used to transmit the water throughout the distribution system.

A typical RWH system can be complemented by a host of other devices and measures to maintain and improve water quality. These include filters, screens, first flush gutters and storage facilities with special tank inlet and outlet configurations. Disinfection, vector control and overflow management measures can also be installed.



Roof catchment



Guttering and downpipe



First-flush diverter and storage



Pump and pressure tank



Filters after storage

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