The Future of Rainwater Harvesting in Buildings
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Perspectives on Rainwater Harvesting: Past, Present and Future

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Outline

- Past
- Present
- Future
- What needs to be done?
- Conclusions

Past

- By no means a modern concept!
- Simple concept
- Systems found in:
  - Israel, Africa, India, 2000BC
  - Mediterranean area, 1700BC
  - Petra, Jordan
- Decline of systems
- Uses of collected rainwater

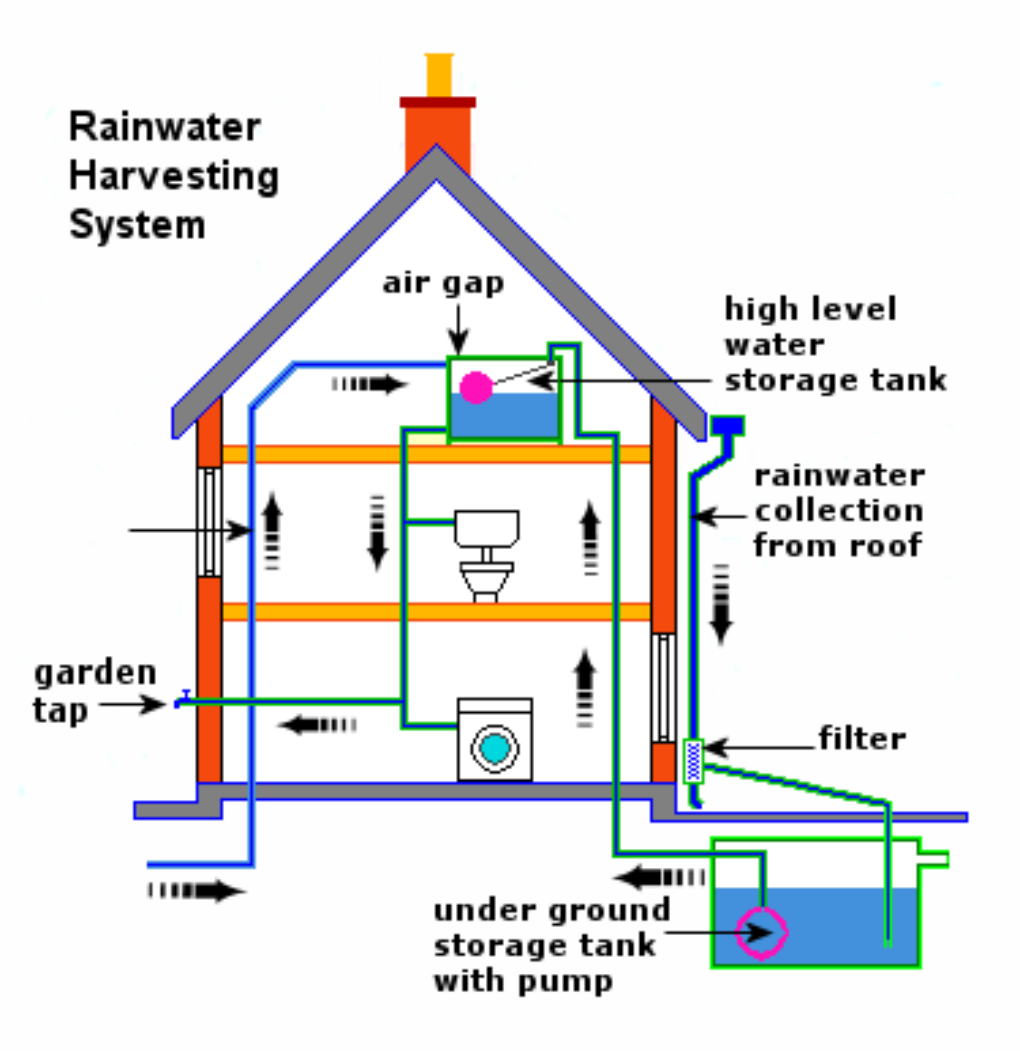
Past

Rain was an important source of water in the ancient trading city of Petra, Jordan, which supported a population of 20,000 in a place where just 150 mm of rain fell a year.

Present

- Present day RWH remains a simple concept
- System Components
  - Catchment
  - Collection system (First flush diverter)
  - Treatment
  - Storage
  - Pump

Present



Indirectly pumped

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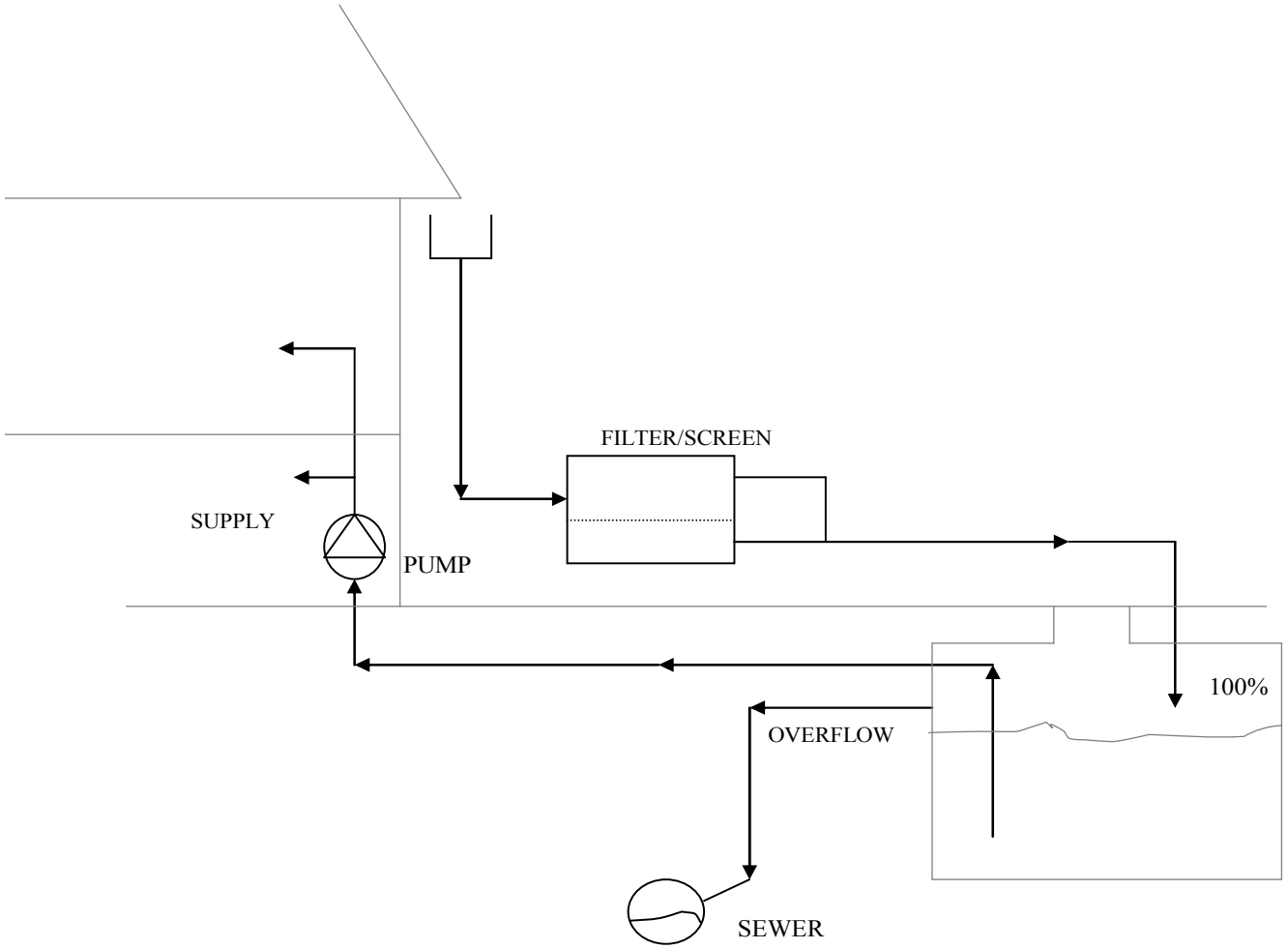
Present



Directly Pumped

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Present

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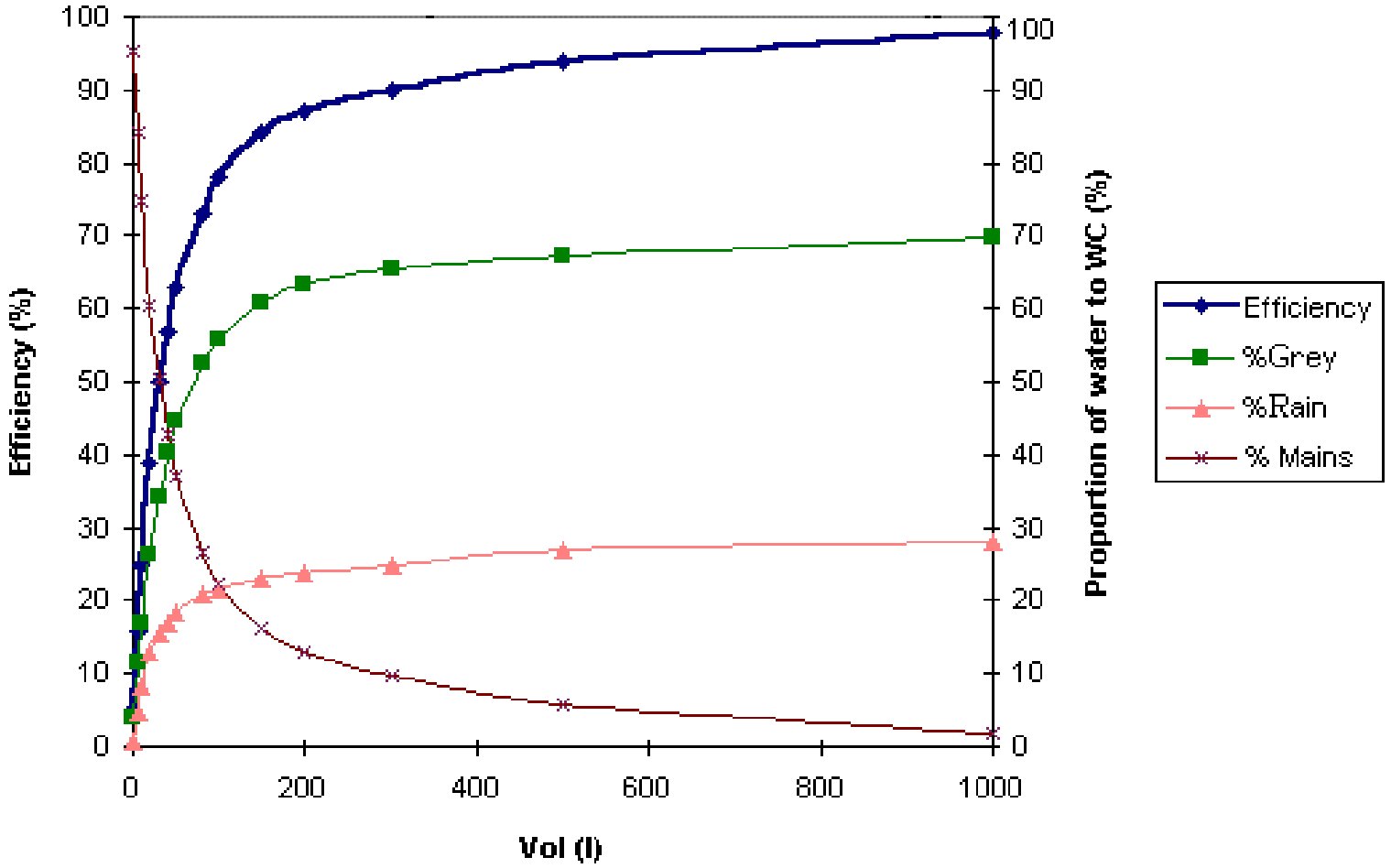
Present
BedZed, London

Present

- Benefits:
  - Saves **potable water** (by displacing non-potable water use)
  - Saves **energy/carbon** (at least that associated with the displaced water)
  - Reduces **flood risk** (especially summer storms & can be enhanced by better design)
  - Reduces **load** on regional water resources and central water infrastructure (and potentially delays/limits expansion)

Present



Saves **potable water** (by displacing non-potable water use)

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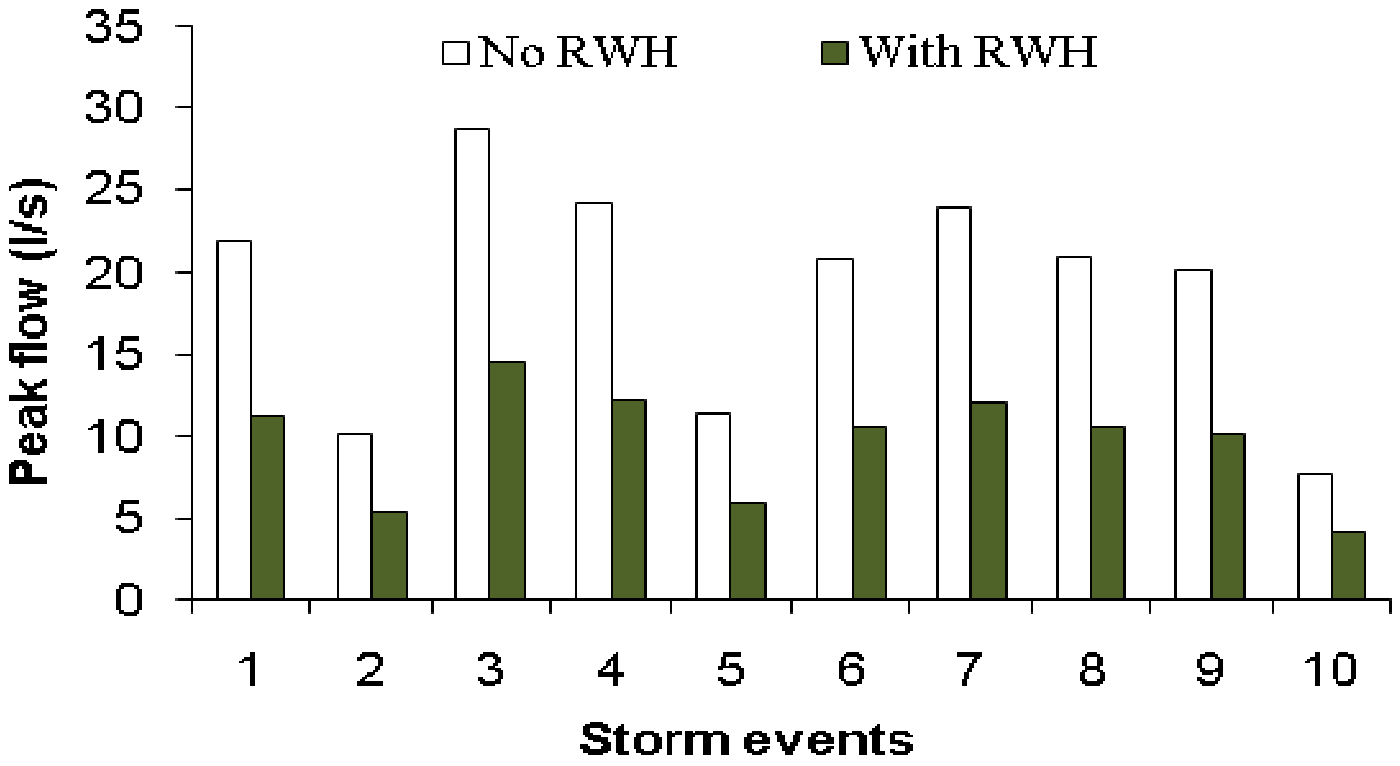
Present



Reduces **flood risk** (especially summer storms & can be enhanced by better design)

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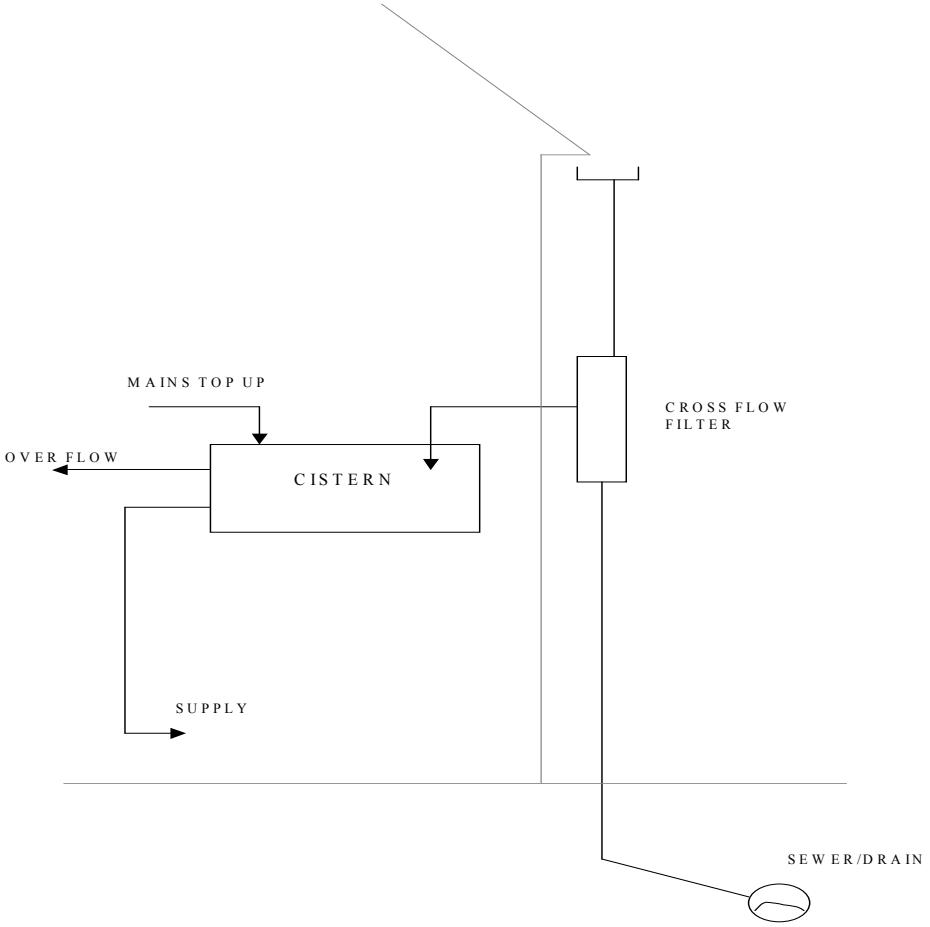
Present

- Drawbacks:
  - Requires **maintenance** (to ensure reliability)
  - Requires **energy/carbon** to operate (at least most current systems) and construct
  - Has potential **water quality** issues (although these are minimised by careful design/installation)
  - **Payback** period depends on scale of provision (shorter in bigger buildings)
  - **Users/specifiers** may be unfamiliar

Future



Gravity Feed Systems

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Future

Rainwaterhogs are modular, DIY, expandable, reusable, and recycled storage units that can be connected to create a custom system placed at several different locations throughout the property.

Future

Dwr Cymru/Welsh Water, consultants **MWH** and manufacturer **Aqualogic** are working to produce affordable wall-mounted rainwater harvesting systems

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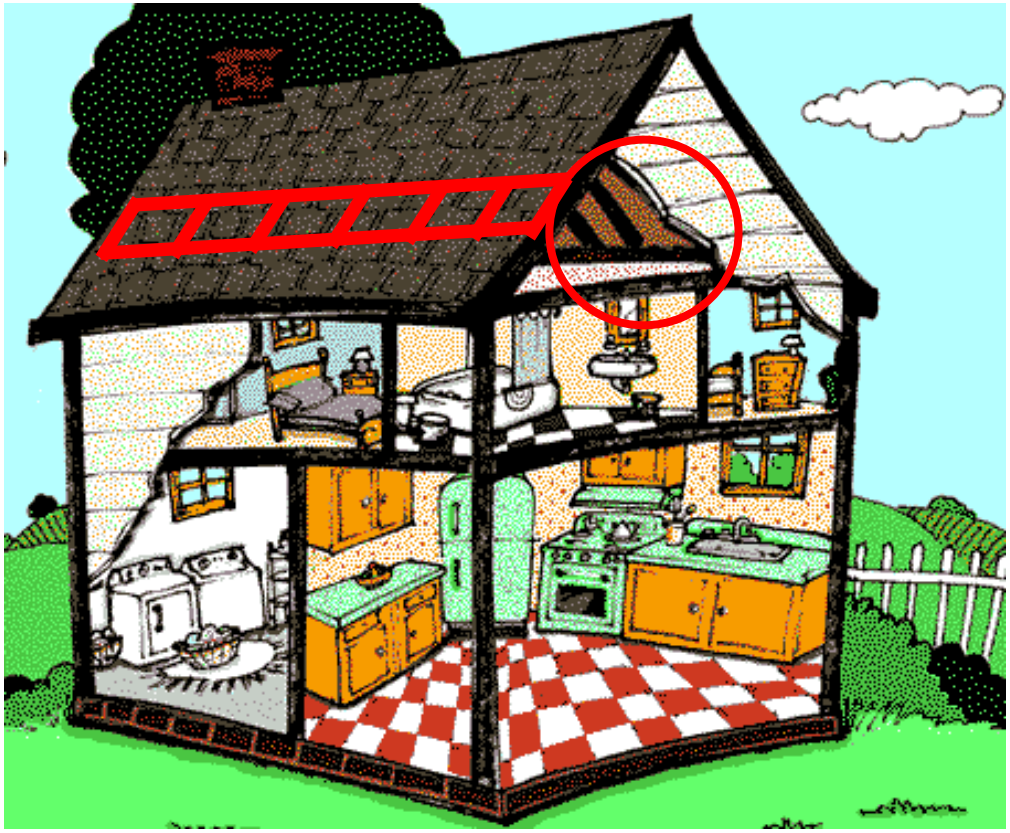
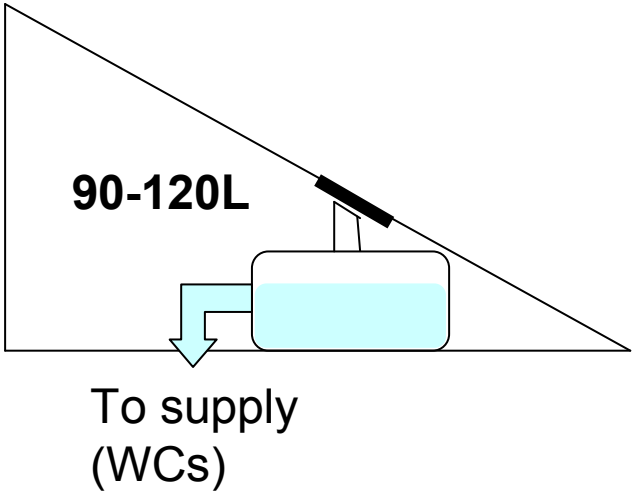
Future





• **Rainsense** is a prototype, patented system that uses tiled gullies to collect runoff part way down the roof and stores the rainwater in modular, storage tanks in the eaves space – then supplies the harvested rainwater via **gravity**

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Future

The **CISTA** rainwater harvesting system provides storage for rainwater within a vertical planted frame, allowing conservation of water and increased green space.

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Future

BabyGROW is a prototype planted water recycling system for collection & treatment of grey and/or rainwater to improve water quality and provide increased green space

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Future

Personal rain saver?

What needs to be done?

- New **RWH designs**, especially for **domestic** dwellings. Need to:
  - be easily **retrofitable**
  - make better use of space for water storage
  - reduce or eliminate the need for fossil-derived energy for pumping
  - be reliable, easy to use and maintain.

What needs to be done?

- New **RWH designs** need to be multi-functional to:
  - supply in-building water needs
  - provide flood protection
  - improve water quality
  - provide a greener environment and
  - use less embedded carbon.

What needs to be done?

- New **business models**:
  - consider system leases from a supplier or water company
  - mitigates the capital cost to user
  - saves money for the householder
  - ensures regular maintenance
  - provides a profit opportunity for the provider.

What needs to be done?

- Improved **governance** of emerging approaches at institutional level:
  - to help lead the way forward
  - to integrate them into everyday thinking
  - by providing authoritative advice and leadership.

What needs to be done?

- Increased **public awareness** and **acceptability** by:
  - Better best practice guidance
  - Incentives and grants
  - Exemplars of successful approaches
  - Identification of ‘trusted’ sources.

Conclusions

- RWH systems are currently appropriate and viable at **large building** scale
- New RWH technologies are emerging for **retrofit** in **domestic dwellings** where there is greatest need and potential benefit
- Creativity and commitment needed on **ownership** and **reliability**.

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Thanks to Alan Fewkes & Sarah Ward for some of the slides used in this presentation

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