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

Indirectly pumped
Present

Directly Pumped
Present
Present

BedZed, London
• 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)
Saves *potable water* (by displacing non-potable water use)
Reduces flood risk (especially summer storms & can be enhanced by better design)
• **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

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.
Dwr Cymru/Welsh Water, consultants MWH and manufacturer Aqualogic are working to produce affordable wall-mounted rainwater harvesting systems
• **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**
The CISTA rainwater harvesting system provides storage for rainwater within a vertical planted frame, allowing conservation of water and increased green space.
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.
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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