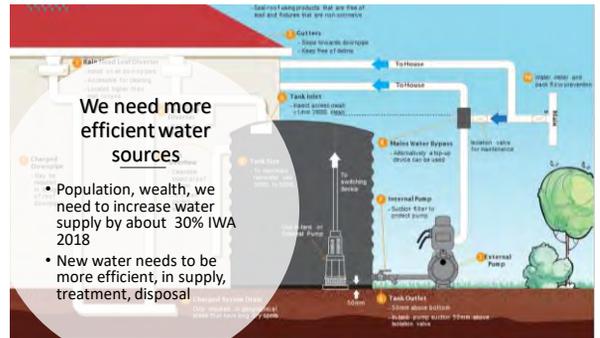


Rainwater Harvesting in the 21st Century

An Australian Perspective
 Michael Smit
 ICID Working Group on Rainwater Harvesting



1



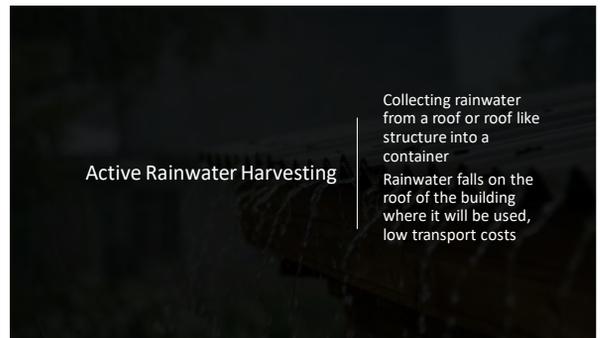
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We need more efficient water sources

- Historical focus on central infrastructure solutions, not natural systems
- Natural systems are decentralised and use minimal amounts of energy and resources to achieve balanced growth

3



Active Rainwater Harvesting

Collecting rainwater from a roof or roof like structure into a container

Rainwater falls on the roof of the building where it will be used, low transport costs

4

Active Rainwater Harvesting

A roof is a non-trafficable surface, few contaminants, little treatment required

Low transport costs, low treatment costs, highly efficient source of water when used in combination

5

Rainwater Harvesting Working Group

- ICID has formed the Rainwater Harvesting Working Group
- Mandate to understand rainwater harvesting as an efficient, local source of water
- Multi disciplinary discussion, water management, irrigation, land use planning, stormwater management, manufacturing

6

Bottom up Systems Analysis

- Systems Framework Analysis, bottom up analysis
- Using top down averages distorts models, behaviour and performance are not characterised by normal distributions

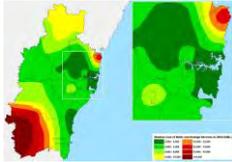
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Bottom up Systems Analysis

- Urban water cycle analysis generated at the lot level
- Integrated modelling of water demand, wastewater, stormwater, recycled water and desalination, climate modelling at 6 minute time steps for 100 years

8

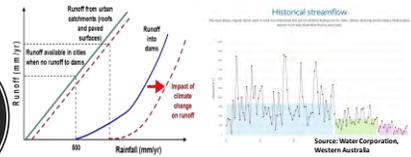
Bottom up Systems Analysis



- Higher water security
- lower infrastructure costs
- Integrated water, wastewater, stormwater urban benefits
- Award winning, international research from Peter Coombes

9

Catchments



- Rainwater Harvesting is much more effective in dry conditions
- We are seeing loss of surface runoff in dry catchments
- Frightening implications
- Coombes and Barry 2008

10

Stormwater – Flooding and Water Quality



- Stormwater impacts are cumulative and non-linear
- Stormwater management needs to be multi scale
- Treating stormwater 'at source' has cumulative benefits throughout the catchment

11

Passive Rainwater Harvesting

- Landscape approach to rainwater harvesting
- Slow it
- Flow it
- Grow it
- Don't stop the water
- ARCSA 2015

12

Australia



- One in four Australian houses has a rainwater tank
- Systems approach, including roofing materials, plumbing, rainwater tank management and pump systems
- Benefits were not apparent until we changed our mode of analysis

Conclusions

- Rainwater falls on the building or land where it will be used, Rainwater Harvesting is the first and most important element of integrated water management
- Integrated water management requires new modes of analysis
- New technologies in building materials, plumbing, tank manufacture and pumps unlocks increased yields and quality
- Integrated water management unlocks new sources of water with greater efficiencies, including rainwater harvesting, aquifer recharge, recycled water, stormwater management

