


City Centre Sustainable Housing Design Competition

Workshop 3: Sustainable Design Generation

Date: 3 April 2024
 Time: 16:00-18:00
 Venue: Online hosted by the CIB

Presenter: Jeremy Gibberd

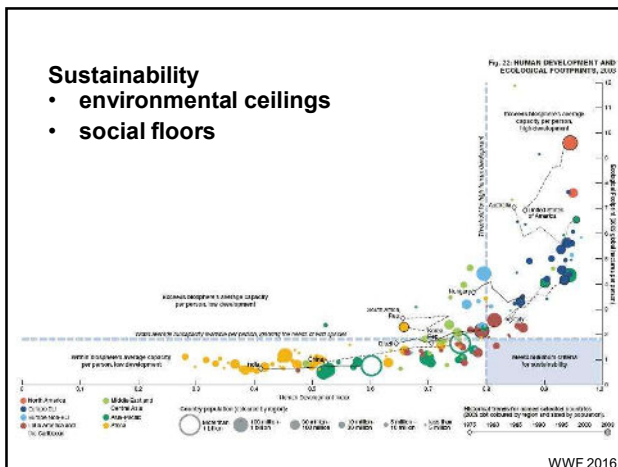


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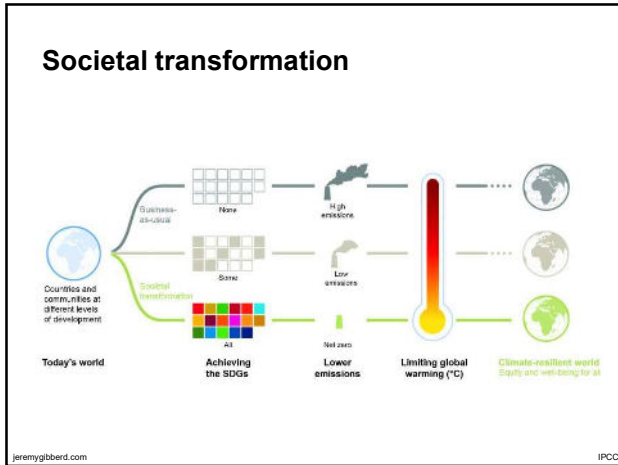
Structure

- Sustainability
- Design
- Sustainable Design Generation

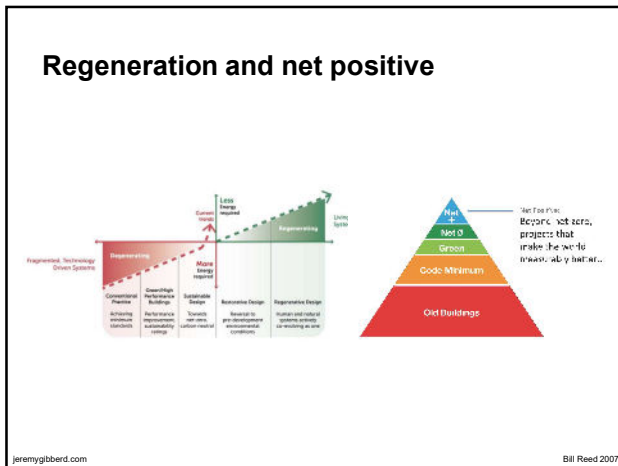
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Generating new ways of thinking

- We cannot solve our problems with the same thinking we used when we created them.

Albert Einstein

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Design

- **Discover:** Understand the problem – speak to people affected.
- **Define:** Set out the challenge
- **Develop:** Develop alternatives for addressing challenge – draw on methods bank, co-design
- **Deliver:** Test out solutions iteratively

JeremyGibberd.com Design Museum

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User requirements

Understanding users:

- Children
- Old people
- Youth
- Women
- Men
- People with disabilities
- Different cultures
- Livelihoods
- Needs
- Fulfilment

JeremyGibberd.com <https://www.simplypsychology.org/> <https://littlegigthinktank.com/>

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Working with what works

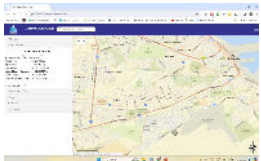
Patterns of use and activities on and around the site

- Pedestrian movement
- Informal trade
- Retail
- Playing
- Gathering

JeremyGibberd.com Gibberd, 2016, Integrating Informal Trade, Sustainable Livelihoods Foundation

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Site characteristics and capabilities



Responding to characteristics and capabilities :

- Rainwater
- Runoff
- Sun
- Shade
- Wind
- Vegetation
- Materials
- Noise

Jeremygibberd.com UN, Gaborone rainwater harvesting, <https://gis.durban.gov.za/solarmapviewer/>

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Form generation



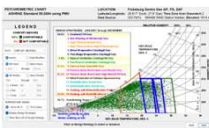
Generating form from:

- Topography
- Solar and shade patterns
- Air movement and wind
- Water flows
- Vegetation
- Microclimates
- Views

Jeremygibberd.com Arup, Parc3it, Mallorca

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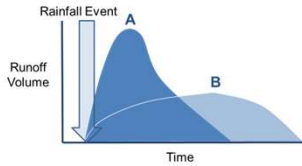
Passive environmental control



- Understand climate throughout the year: max and min temperatures, humidity, rainfall, solar, wind
- Understand occupants: age, clo, Understand activities: mets
- Passive environmental control strategies
- Direct/indirect solar gain
- Night-time cooling
- Thermal mass
- Cross ventilation

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Events and change over time



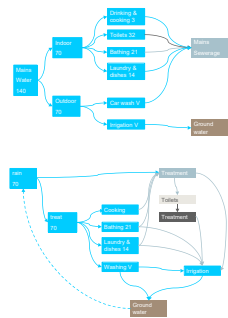
Understanding and representing events and change over time

- Rainwater
- Temperature
- Solar and shade patterns
- Air movement and wind
- Water flows
- Vegetation
- Microclimates

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Representing and optimising systems



Representing and designing systems in and around buildings:

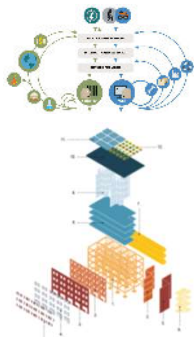
- Water
- Food
- Materials
- Energy

- Sources
- 'Loopiness'
- Outputs

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Circular built environments



Moving from linear to circular systems

- Design out waste
- Regenerate natural systems
- Share
- Optimise
- Loop
- Virtualise
- Exchange

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Ellen McCarthy, Gibberd, Westerholm, Buoyalis, Hakaste, 2022

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Local



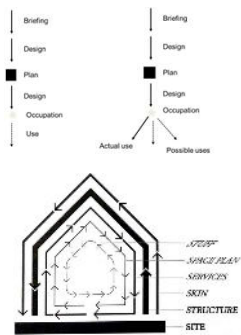
- Local materials
- Local skills
- Local manufacturing
- Maintenance and repairs
- Local content standards
- Local diverse resilient economy
- Local enterprises and employment
- Retention

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<https://www.heritancehotels.com/kandalama/#fancyboxgroup-1>

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Planning for future change



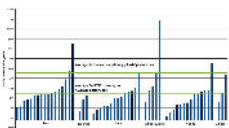
- Planning for change
- Change in the area
 - Change in the building
 - Stewart Brands'
 - Site
 - Structure
 - Skin
 - Services
 - Space
 - Stuff

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Stewart Brand

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New ways of living and working

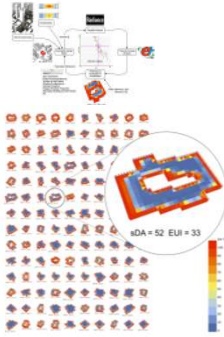


- 45% less energy (3.4kWh/person/day)
- 50% less water (87l/person/day)
- 60% waste recycled (4.5kg/person/week)
- 86% buy organic food
- 36% grow some of their own food
- 84% better community facilities
- 60% less car ownership

<http://www.oneplanetcommunities.org/wp-content/uploads/2010/03/BedZED-seven-years-on-low-res-final.pdf>

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Optimising for performance



- Define performance standards
- Generate lateral and alternative options
- Select and optimise performance iteratively
- IE Optimise for daylight, energy and views

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Konis K. and Selkowitz S. (2017).

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Thank you, Questions?

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