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The future of water infrastructure services in an impacted world

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Melbourne, VIC, Australia

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Delivering a better world

 [aecom.com](https://www.aecom.com)

Agenda

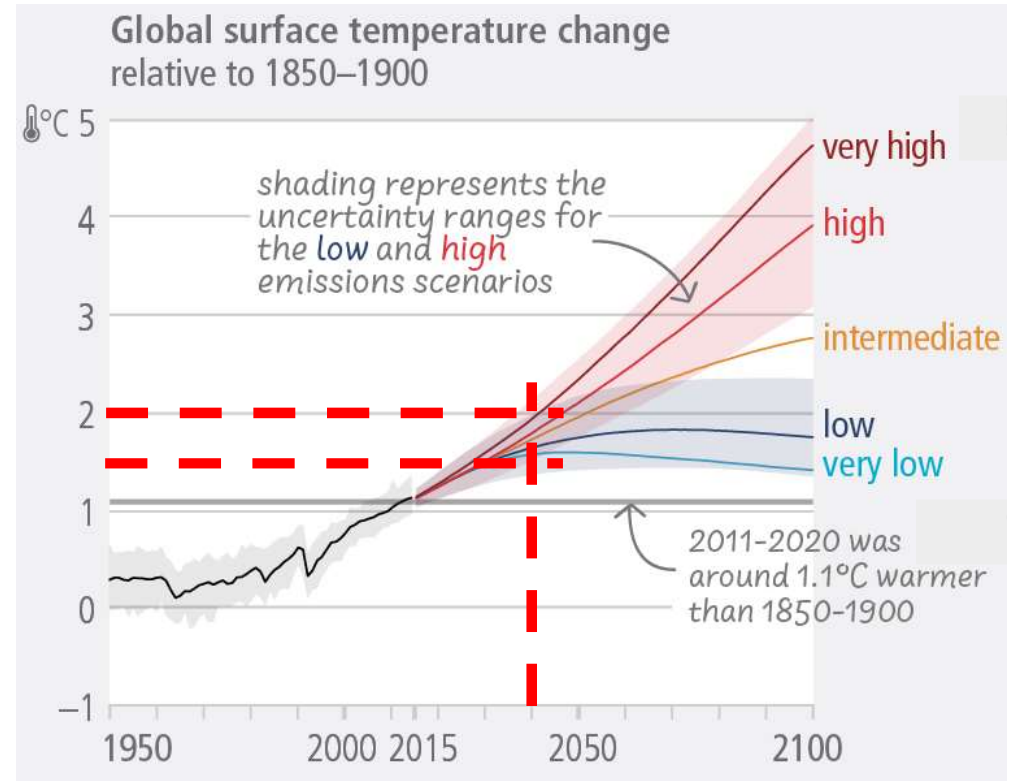
1. The world in 2040
2. Some key concepts
3. Relevant evolving trends
4. Water services in Australia in 2040

01

The world in 2040

Emissions – and warming – are rising

- 2040:
 - global warming most likely in range 1.5°C to 2.0°C
- Paper:
 - Polar ice sheets and tipping points @ 2.0°C
 - Direct human impacts @ 2.0°C
 - Australian context @ 2.0°C



Part (a) of Figure SPM.4 from IPCC, 2023

Going from 1.5°C to 2.0°C

South Asia @ 2.0°C

Himalayan glaciers deplete by 50%

Affects Indus, Ganges, Brahmaputra rivers

129 million people dependent on meltwater

Sea level rise, saline intrusion - Bangladesh

Going from 1.5°C to 2.0°C

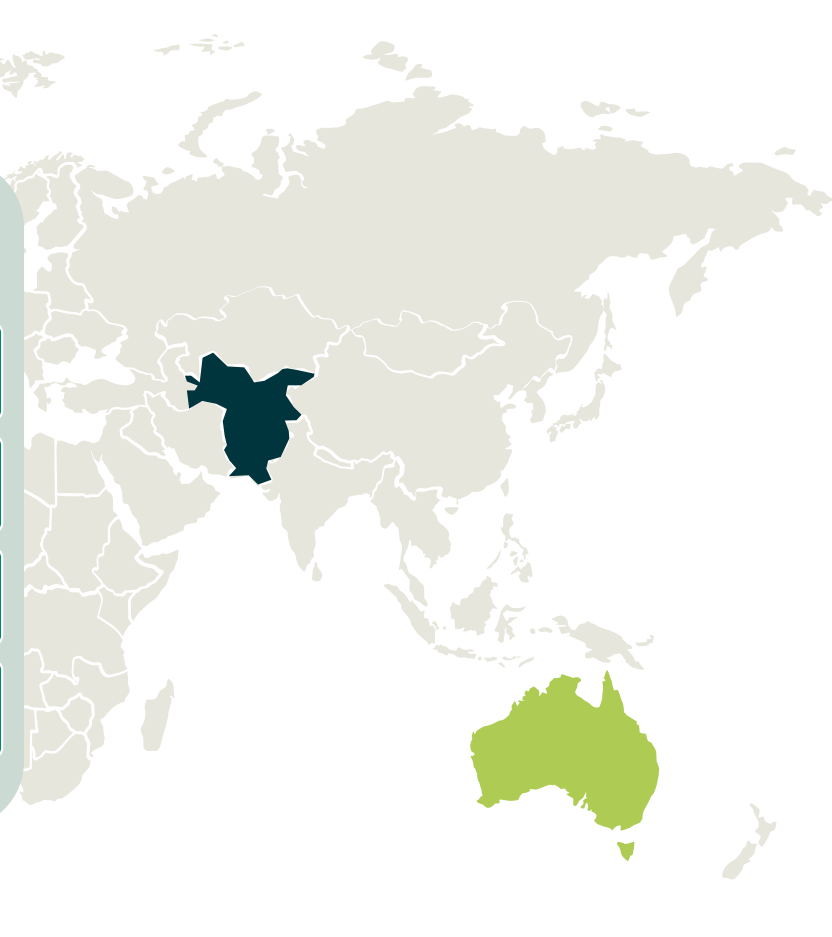
Central Asia @ 2.0°C

Himalayan glaciers deplete by 50%

221 million people dependent on meltwater

Social instability, conflict -> migrations

Central Asia has already seen 'peak water'



02

Some key concepts

Some key concepts

Economic growth

Green growth

Net-positive

Net-zero emissions

Degrowth

Post-growth

Doughnut economics

Some key concepts

Degrowth



Sustainability
Never deteriorate
supporting ecosystems



Circularity
Waste not,
want not



Cooperation
People and planet,
Not profit



Useful production
What is not needed
should not be made



Sharing
Sufficiency for all,
excess for some



Local Production
Produce local,
consume local



Work-Life Balance
Work less,
play more



Relational Goods
Less stuff,
more relationships



Joie de Vivre
If I can't dance,
I don't want to be part
of your economy!

Some key concepts

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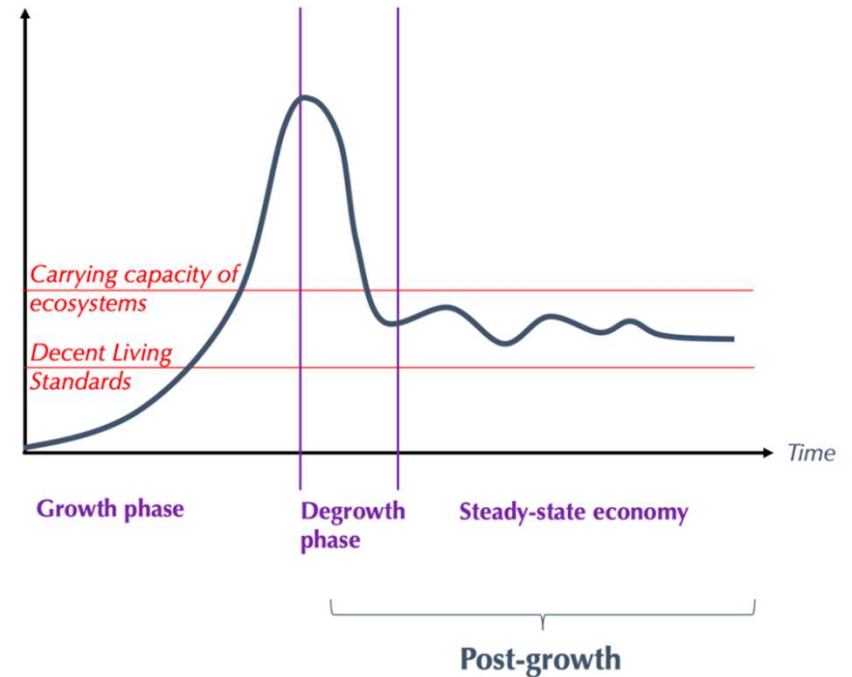
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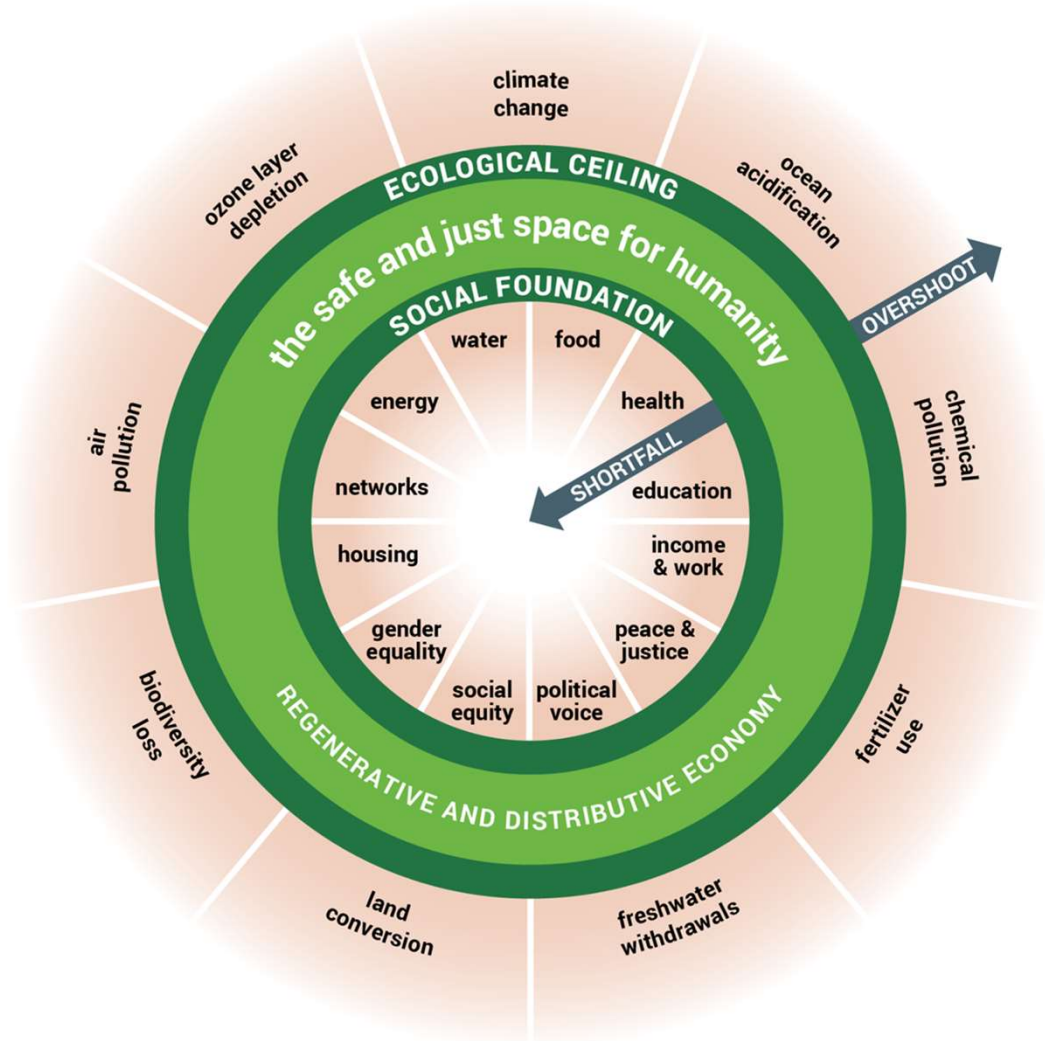
Postgrowth

Size of the economy (cet.par.)



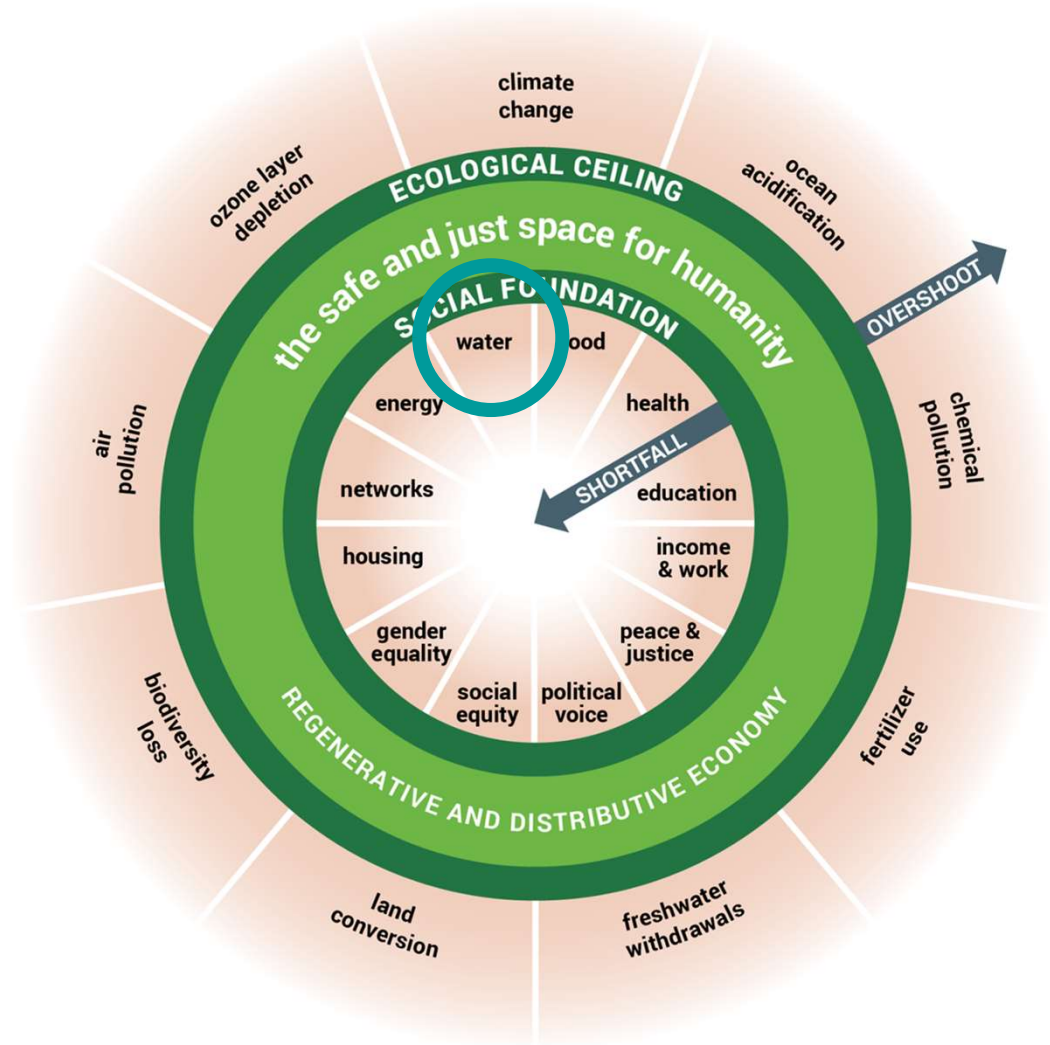
Some key concepts

Doughnut Economics



Some key concepts

Doughnut Economics



Relevant evolving trends

Climate and conflict refugees – 50% depletion of Himalayan glaciers

- Over 300 million people without subsistence food
- Conflict driven by water scarcity (like Ethiopia, Afghanistan, Syria, Sudan)
- Seeking to migrate within and from those regions
- Will migrate by land and by boat
- United Nations may require Australia to take our refugees
- Even 2% would be 7 million people

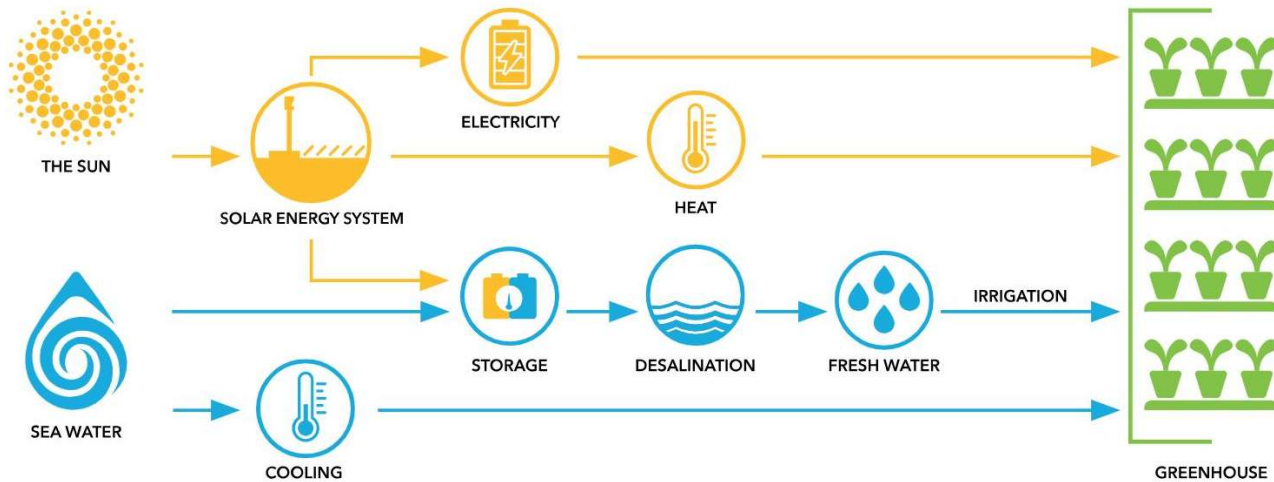


Manufactured water

- El Niño - more frequent and longer -> more droughts for eastern states
- Population movement:
 - Away from northern Australia (heatwaves)
 - Inward migration
- Water for food in a drying climate and better protection of GAB, Murray-Darling
- By 2040:
 - Several direct potable reuse plants
 - Desalination of seawater for food, like Sundrop Farms ...

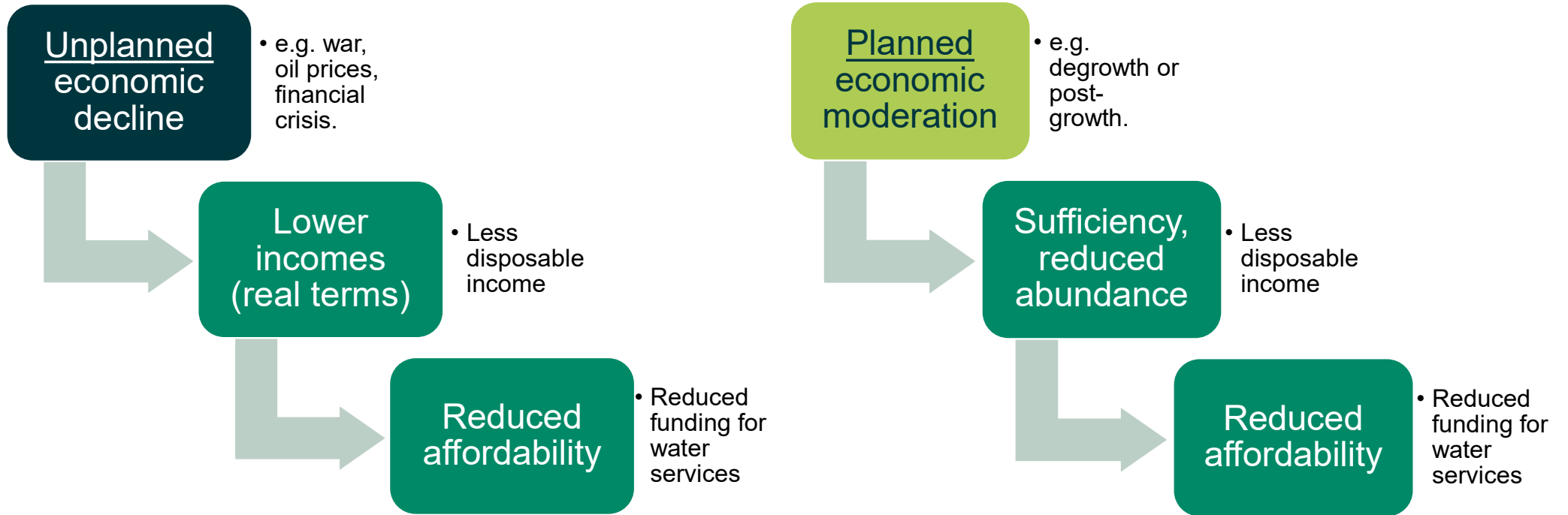
Manufactured water for food

- Arid South Australia
- Tomatoes for Coles - all Australia
- Seawater and sunlight are the inputs



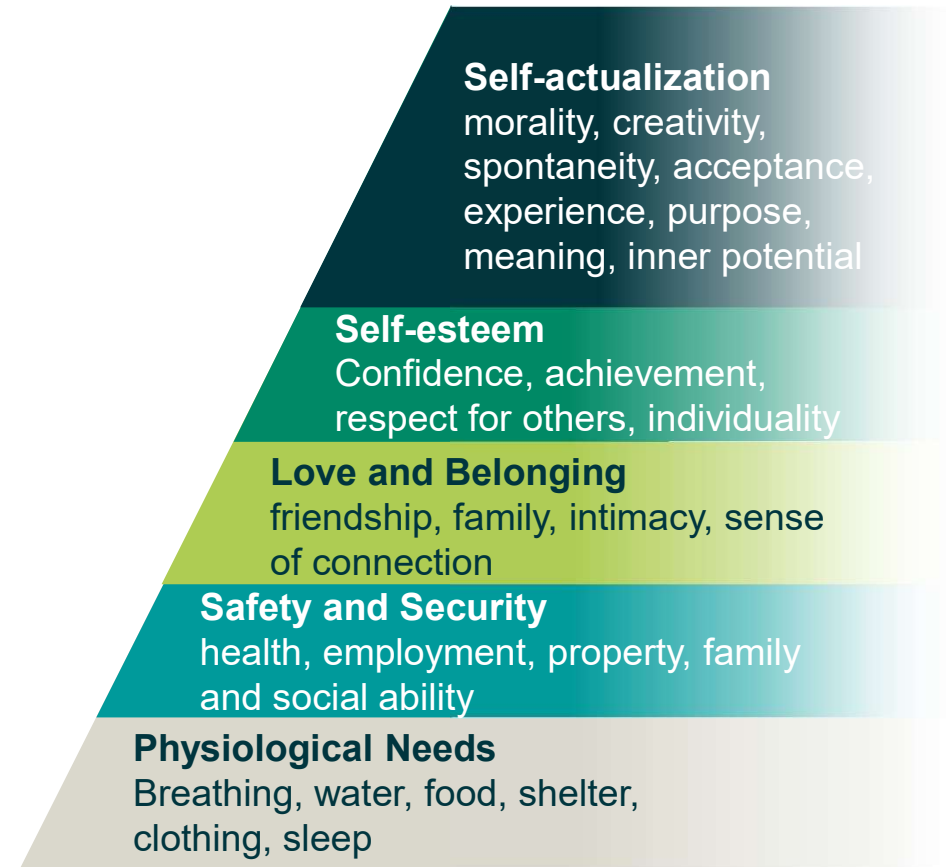
Source: <https://www.sundropfarms.com/our-technology/>

Affordability of Water



The Importance of Water

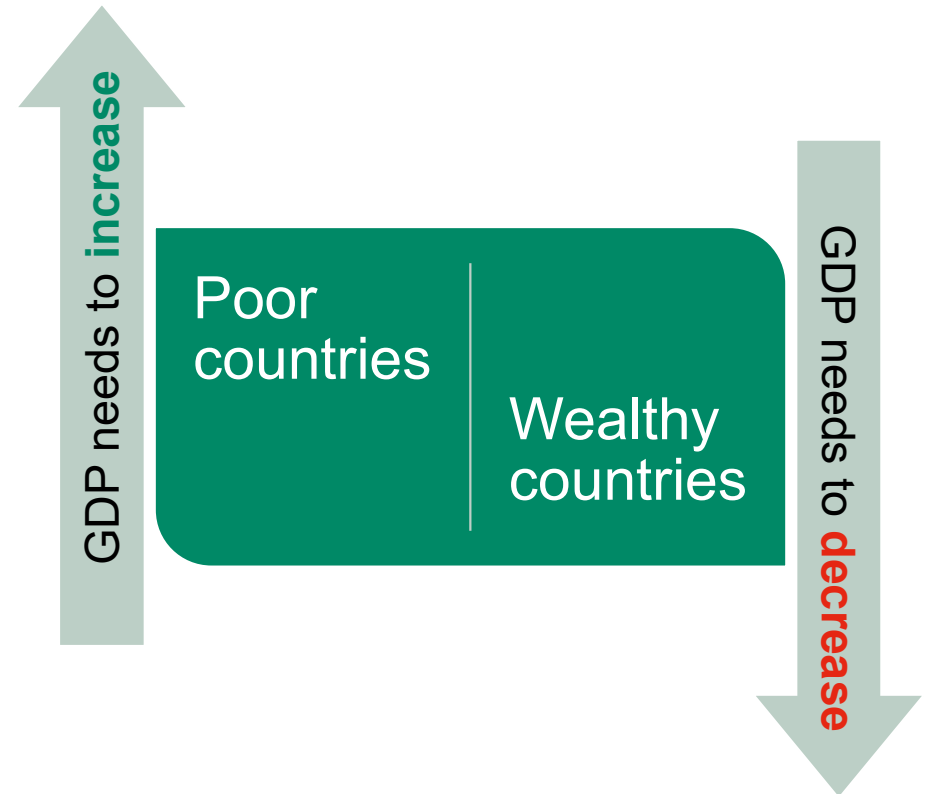
- First – air
- Second – water
- ...
- These are not needs:
 - Private transport
 - Subsidising fossil energy
 - Resources for engineered obsolescence
- In economically constrained world:
 - Several state-funded services would need to decline
 - Truly essential services would have primacy



Source: Maslow's Hierarchy of Needs (Maslow, 1943)

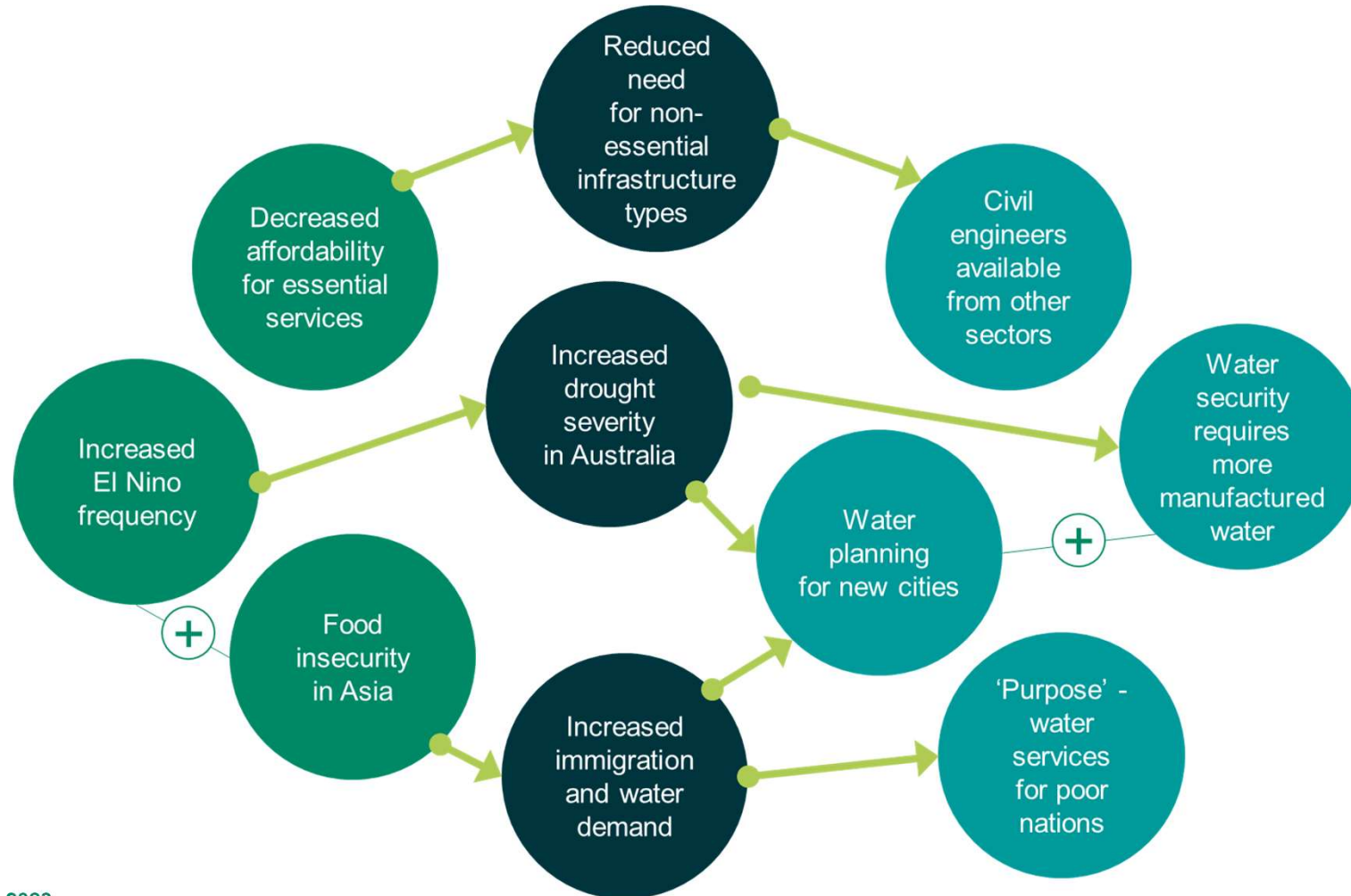
Equity in water services – locally and globally

- **Wealthy countries**
 - Sufficient basic services
 - Less excess and waste
 - Better well-being
 - More ecological regeneration
- **Poor countries**
 - Food and water security
 - Sufficient human services
 - Ecological regeneration
- **Social equity**
 - Assistance from wealthy to poor countries for water solutions
 - Not charity – perhaps “Loss and Damage Fund”

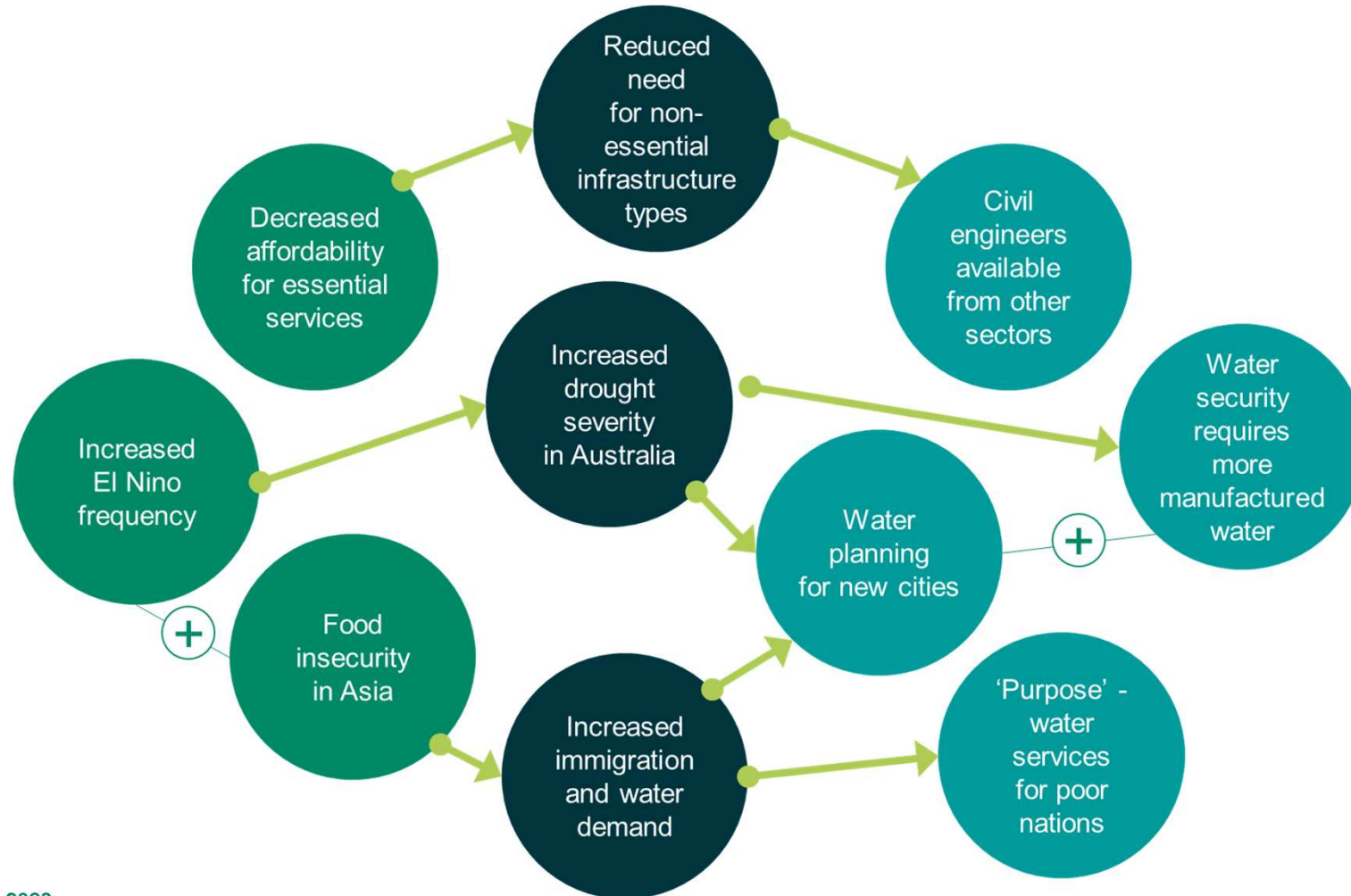


Water services in Australia in 2040

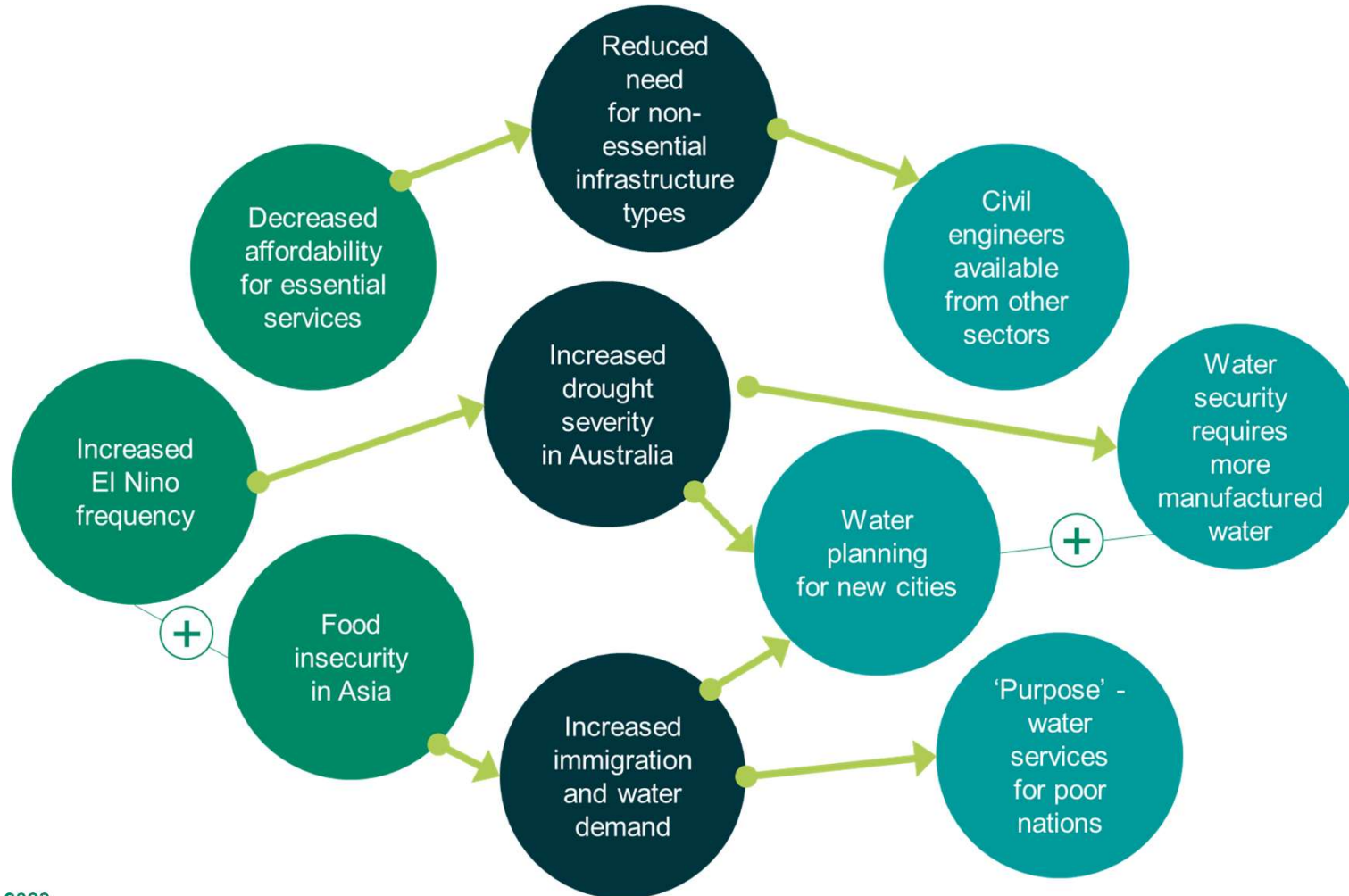
Water services in Australia in 2040



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Water services in Australia in 2040

- Increased demand for water professionals
- Increased need for manufactured water
- Planning, engineering, construction and operation of water supplies for vast new population centres
- Purposeful paid water engineering services to poor countries

The future for water engineers looks bright, exciting and purposeful!

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