



**AUSTRALIAN CENTRE FOR  
EDUCATION & TRAINING**

# **ACET-Global: the importance of education and the environment**



Australian expertise



25+ university collaborations



15+ years of business experience



20K+ people trained globally



15+ years of lecturing globally

## Corporate Social Responsibility



Global Peace Project



Global Sanitation and Sustainability Project



Global Road Safety Project



Global Entrepreneurship Project



Global Climate Action Project



Global Water Management Project



Global Air Quality Project

# Acknowledgement of Traditional Custodians

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We acknowledge the Traditional Custodians of the land on which we work and live, and recognise their continuing connection to land, water and community. We pay respect to Elders past, present and emerging.

## Speaker profile - Miranda

- Business Relations Officer
- International Relations and Sociology
  - Environmental policy, management, and communication
- Sport/Camping/Cooking/Travel



## Speaker profile - Daniella

- CSR Project Supervisor and Business Relations Officer
- Environmental Science
- Community engagement and education
- Dance/Art/Camping



## Global Water Management Project (GWMP)

- What is the problem? How severe is it?
  - Water scarcity
  - Poor water quality
- What is the impact? Why act on it? Why learn about it?
- What are the solutions? What actions can be taken by organisations, governments, and individuals?



# What is the Problem?



## 1. Water Scarcity

- $\sim\frac{2}{3}$  of the global population experience severe water scarcity during at least one month of the year (UN, 2021)
- Under current practices, the demand for water is likely to exceed supply by 40% in 2030 (UNEP, 2016).
- $\sim\frac{1}{2}$  of the world's population will suffer severe water stress by 2030 (UNEP, 2016).

**Perth's** dam water capture has decreased from 300 billion to 25 billion litres a year. Despite this, residents each use on average 335 litres of water a day.

(Gnangara sustainability strategy taskforce, 2009; Ceranic 2018).



# What is the Problem?

## 2. Water Quality

- Unsustainable land use practices and inadequate management of wastewater and stormwater can lead to:
  - Toxic pollution of waterways
  - Spread of pathogens
    - E. coli and cholera
  - Eutrophication

(Machdar et al. 2013)

- 785 million people globally lack access to clean drinking water

(World Vision, 2018.)





# Why is this Important?



## Human Health

- Essential for sustaining life
- Risk spread of disease and public health crises
- Poor sanitation and hygiene causes the death of approx. 800 children day

(World Vision, 2018)

## The Environment

- Essential for the functioning of all ecosystems
- Threat to wildlife and biodiversity
- Impact on agricultural productivity and food security

## Social and Economic

- 700 million people worldwide displaced by 2030 due to intense water scarcity (UN, 2021)
- Economic pressure for receiving countries
- Risk of lost cultures

# What are the Solutions?



1. **Ecological restoration** → improves storm water quality
2. **Wastewater treatment** → recycles wastewater
3. **Waterless toilets (GSSP)** → reduces wastewater quantity
4. **Sustainable production and conscious consumption of fashion** → addresses water over-consumption and water pollution
5. **Reformed agricultural practices** → reduces water consumption
6. **Individual actions** → minimises our direct and indirect water consumption



# Action 1: Ecological Restoration

Stormwater systems aim to prevent flash flooding by quickly moving excess rainwater out of an urban area.

However, stormwater can pick up various types of pollutants, such as:



**Garden Waste**



**Animal Waste**



**Chemicals**



**Litter**



**Oil and Grease**



**Soil**



A typical open stormwater drain.  
Sydney, Australia

This leads to heavily polluted and toxic waterways such as city wetlands and beaches, making them unsafe for humans, aquatic life, and eco-systems.

# Action 1: Ecological Restoration



- Highly artificial concrete stormwater channels does not allow nature to filter the water.
- Restoring wetlands can assist in improving water quality and simultaneously restore lost ecosystems.
- Ecological restoration improves water quality by:

## Reduced Nutrient Levels

Studies conducted in Melbourne's northeast showed that restored floodplains reduced nutrient levels and thus reduced eutrophication.

(Bonneau et al. 2020)

## Role of Microbes

The presence of healthy algal communities as part of restored Floridian streams helped reduce nitrogen levels.

(Griffiths et al. 2021)

## Reduced Soil Runoff

Even tiny "pocket wetlands" can reduce sand and clay from building sites from choking waterways.

(Krompart et al. 2018)

# Action 1: Ecological Restoration -



## Elsternwick Park Nature Reserve Case Study

- In 2018, the Elsternwick Park Golf Course (left) closed to establish the Elsternwick Park Nature Reserve (right).
- The reserve receives water from the Elster Creek, which carries stormwater from nearby suburbs.
- Water that passes through the reserve enters the Elwood Canal and then Port Phillip Bay



Return of Native Species



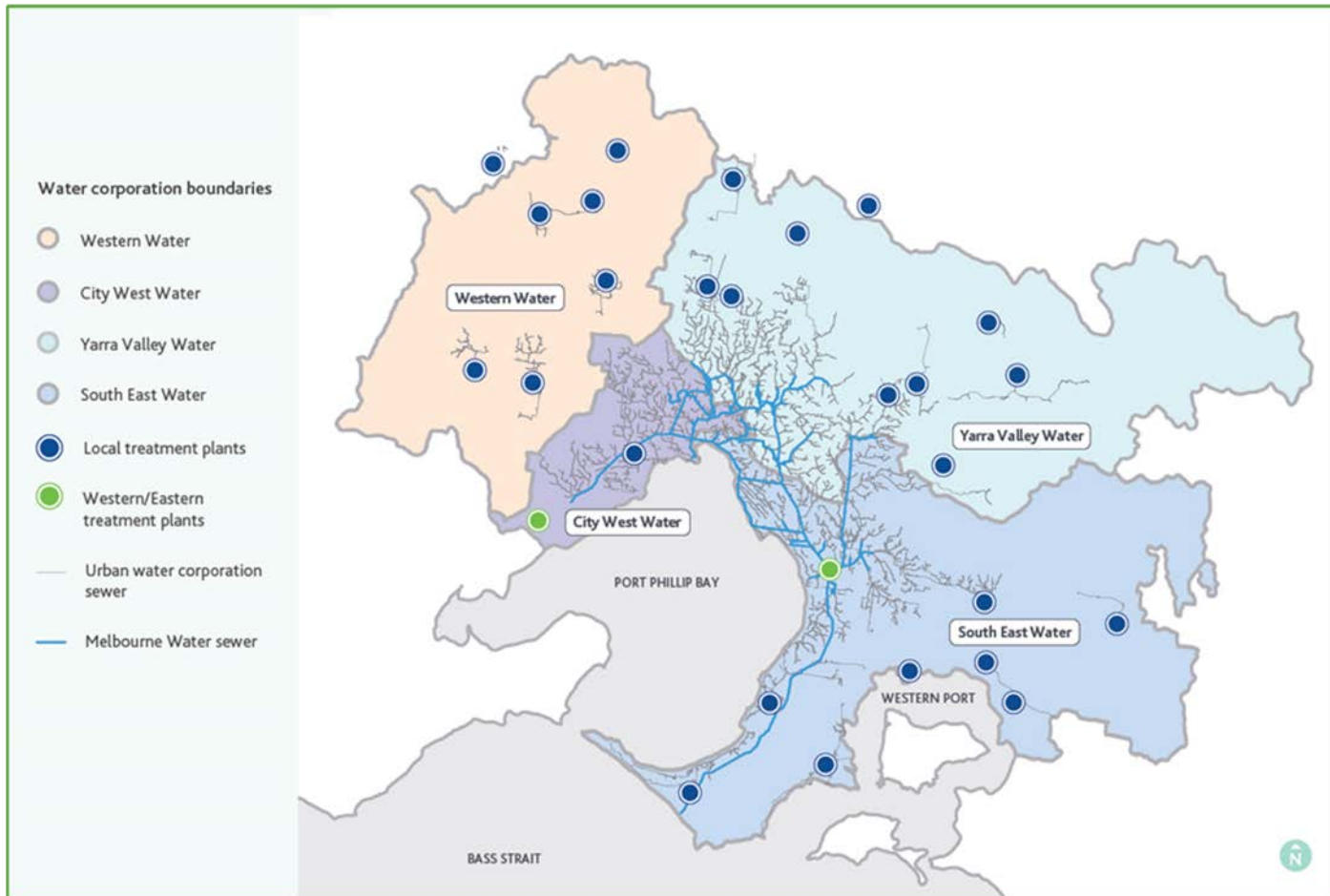
Nutrient Sink



Flood Mitigation

# Action 2: Wastewater Treatment

Wastewater treatment facilities recycle sewerage or polluted water. This stops wastewater from flowing down city streets



The Western Treatment Plant in Werribee, Victoria, treats 50% of Melbourne's sewerage. It takes up 110 square kilometres.

Melbourne's wastewater system developed in the late 19th century

# Action 2: Wastewater Treatment - Evaluation



## POSITIVES



Treatment plants have become an important bird habitat.



Recovered biogas powers most electrical needs.



Water and biosolids are reused by industry and irrigators.



Water re-entering the environment is well treated.



## NEGATIVES



Water cannot be re-used for drinking without desalination



Too much water enters the sewerage system to begin with



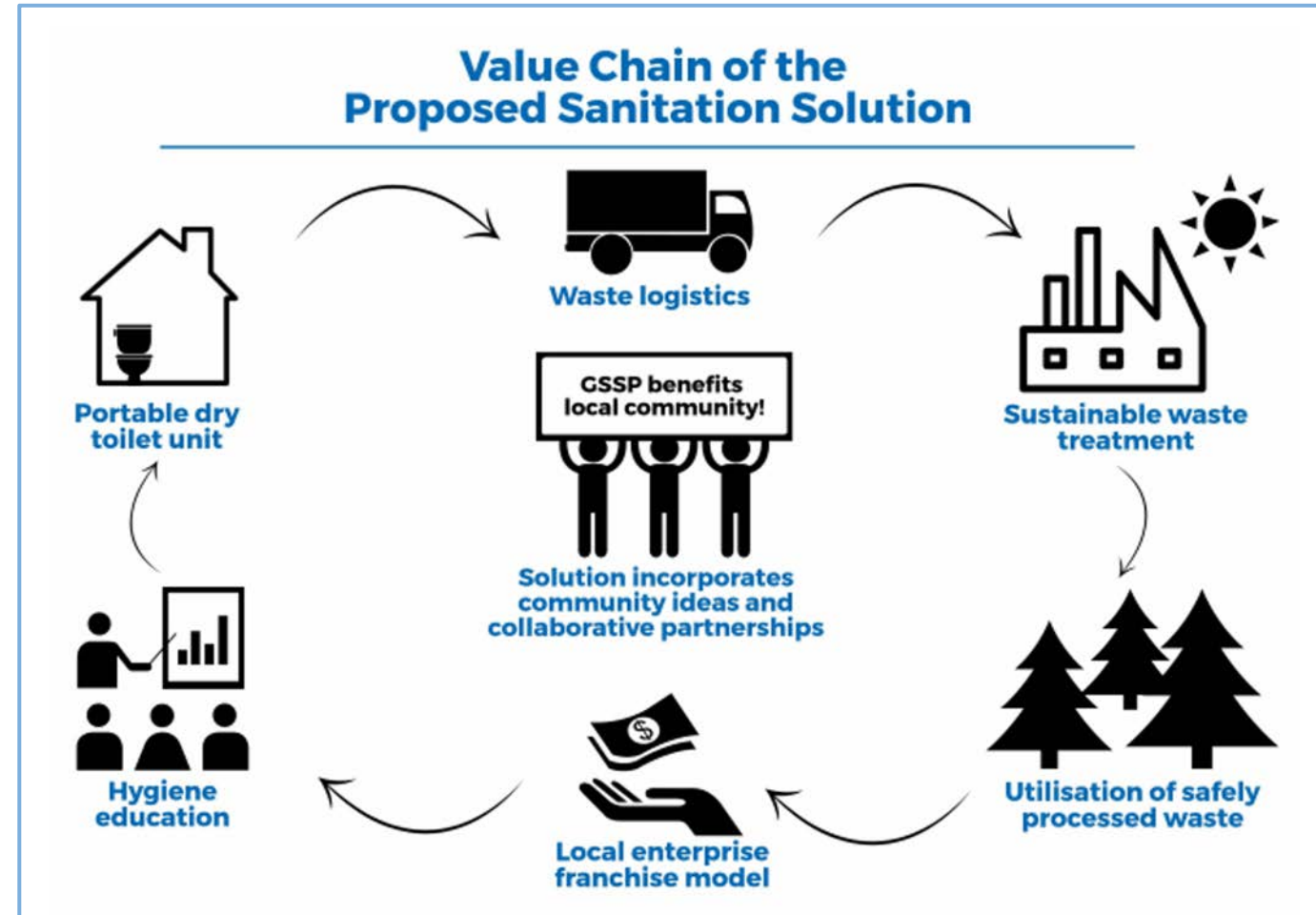
Sewerage is largely treated to be disposed of, rather than reused.



System is ill-equipped to deal with climate change.

# Action 3: GSSP Waterless Toilets

- ACET-Global's Global Sanitation and Sustainability Project **sustainable waterless toilet scheme**
- Minimises total water usage to address water scarcity
- Reduces sewerage and wastewater production to improve water quality
- Additional benefits:
  - Improve local hygiene awareness
  - Create local jobs
  - Relieve pressure on wastewater treatment facilities



<https://www.acet-global.com/global-sanitation-and-sustainability-project.html>



# Action 4: Sustainable Fashion Production and Consumption



- **93 billion cubic metres** of water are used per year, enough to meet the needs of 5 million people (The World Bank, 2019).
- A cotton t-shirt takes **2,700 litres** of water to grow and produce, enough for 1 person to drink in 2.5 years (National Geographic, 2013).
- **5 trillion liters** of water used worldwide each year for fabric dyeing, enough to fill two million Olympic-sized swimming pools (Drew & Yehounme, 2017).



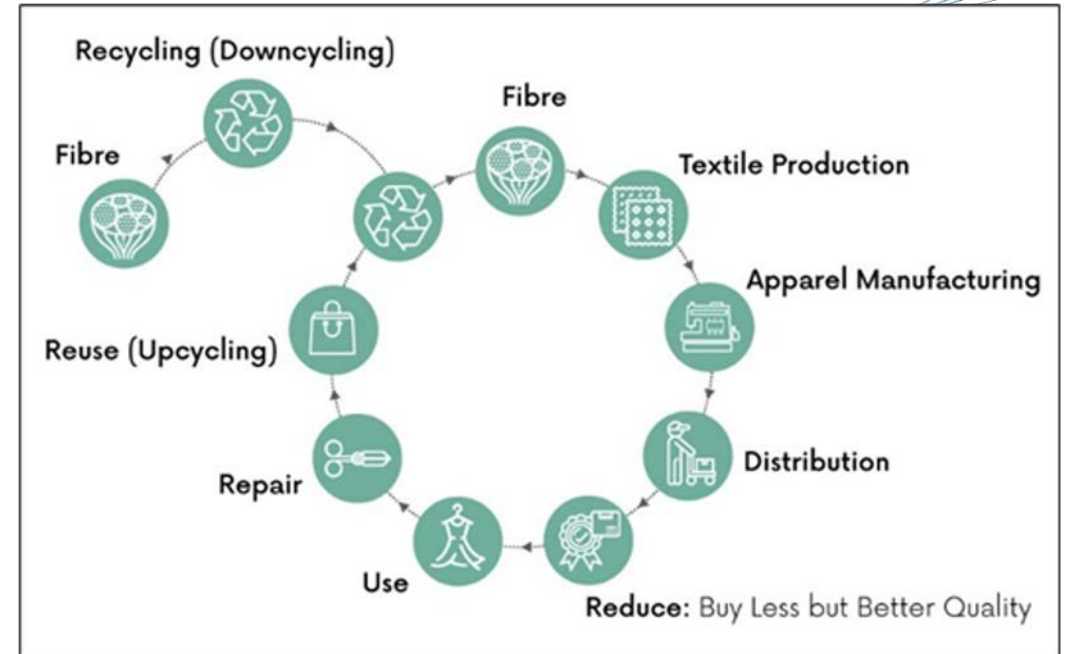
The Aral Sea in Central Asia in 2000 (left) and 2014 (right)



- Textile dyeing is the world's second largest water polluter (McFall-Johnsen, 2020)
- The industry accounts for **20% of global wastewater** (UNEP, 2019), and
- **9% of total microplastics** lost to the ocean each year (UN, 2021).

# Action 4: Sustainable Fashion Production and Consumption

## A circular economy for fashion



### *Patagonia Case Study*

- 2019 *UN Champion of the Earth Award: outstanding entrepreneurial vision*
- 87% of overall fabrics made with recycled materials
- 100% of virgin cotton used is organically grown
- Repair and reuse program → Rejects fast fashion and over-consumption

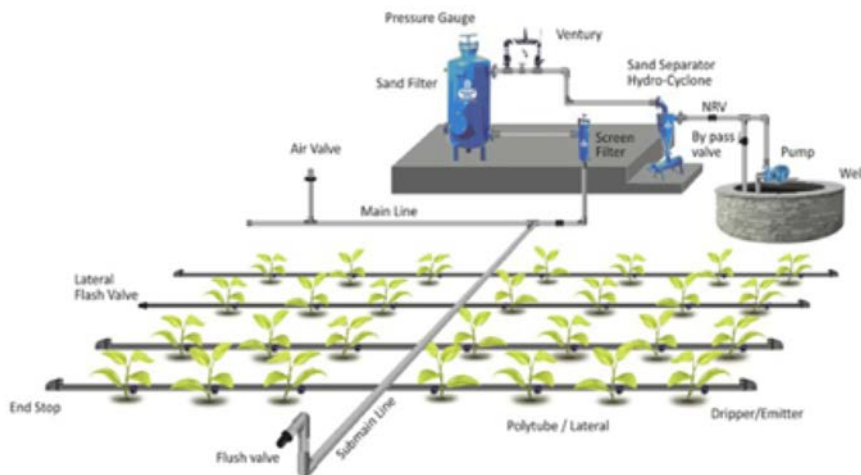


# Action 5: Sustainable Agriculture

In Australia, although Irrigation occupies a very small portion of our land— 5% of tilled agricultural lands –it produces 30% of all agricultural production.

However, irrigated agriculture also uses about 60% of the water available for human use

A more sustainable, emerging method of irrigation is becoming increasingly popular. Called drip irrigation.



Sprinkler irrigation technique

# Action 5: Sustainable Agriculture

## Vertical farming

- The practice of growing crops using soilless farming techniques such as hydroponics, in vertically stacked layers.



Major Summer, Elder of the Ngarrindjeri



## Indigenous knowledge

Only 17 years ago policy-makers first recognised Indigenous rights and interests in national water policy.

Government in action:

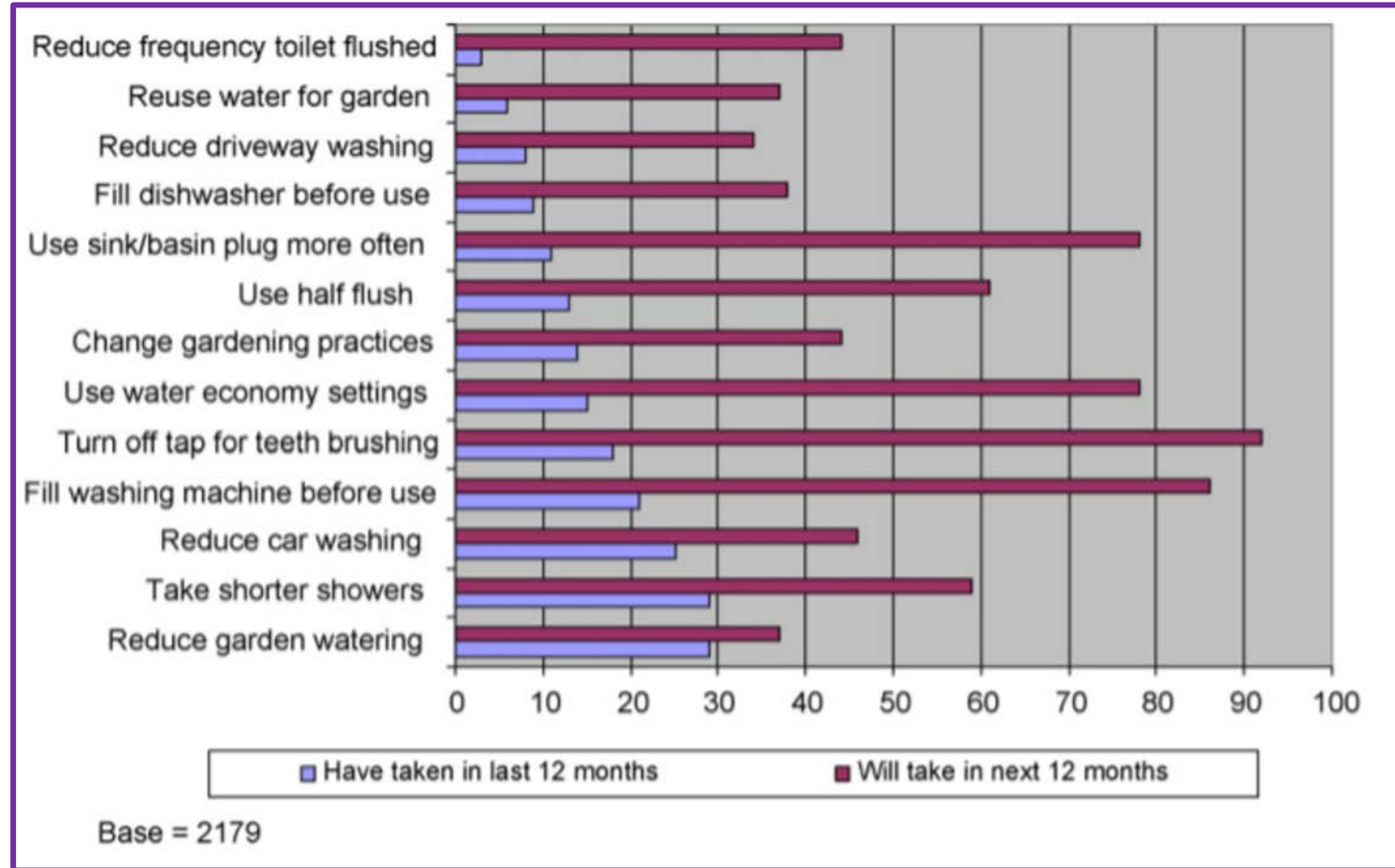
- The Water Act 2007 (Cth)
- The Cultural Flows project
- Aboriginal Waterways Assessment Program

# Action 6: Minimising our *Direct* Water Consumption



- Annually, **100 000 L of freshwater per person** is consumed through direct (household) uses (McGee 2013)
  - Main indoor uses are showers (34%), toilets (26%) and laundries (23%)
  - Outdoor uses mostly for gardening (40% of total direct use)

Actions taken in the previous 12 months to reduce water consumption and actions predicted to be taken in the next 12 months to reduce water consumption (Troy & Randolph 2008)



# Action 6: Minimising our *Indirect* Water Consumption



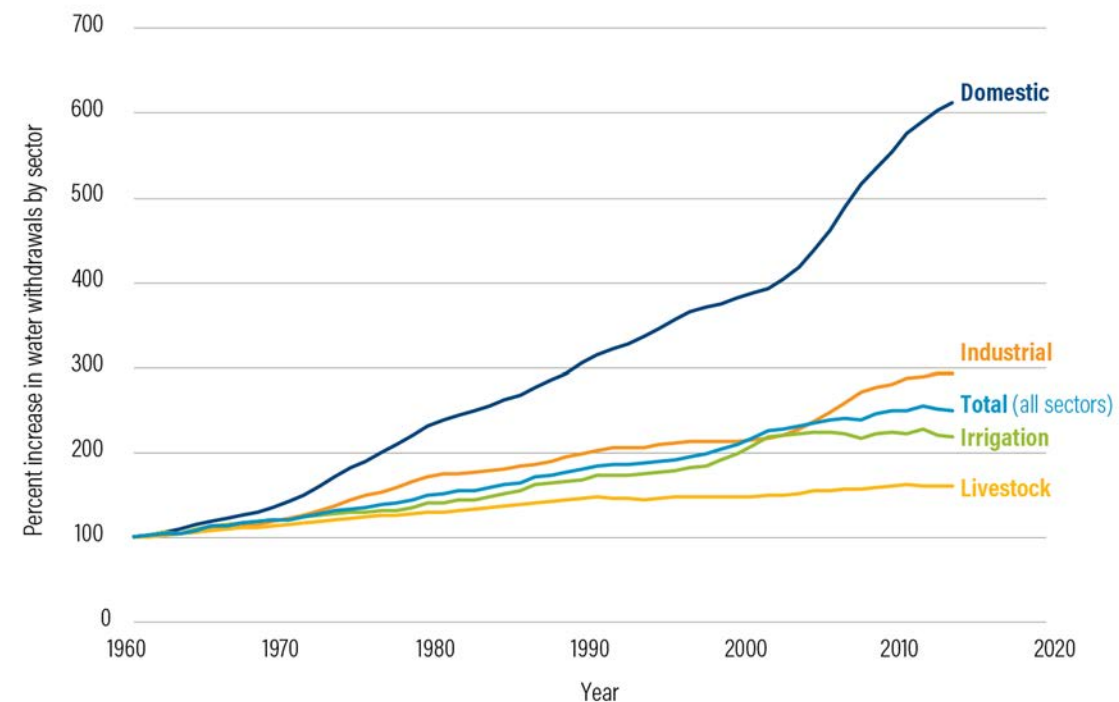
Most (**90%**) of water consumption in Australia is **indirect** (McGee 2013).

The Australian **agricultural industry** accounts for more water use than any other individual industry (Argent, R 2016).

There are four main ways to reduce water consumption through mindful food consumption (Rutherford, Tsang & Tan 2007):

1. Reduce **food waste**
2. Select **comparable products** which use less water
3. Select **types of food** which use less water
4. Adopt a **vegetarian diet**

Domestic water withdrawals increased more than 600% since the 1960s



Source: Authors.  
20.2.10

AQUEDUCT

WORLD RESOURCES INSTITUTE

# Where to go from here

- Eco- anxiety
- Power of individual action
- Resources
- Education



<https://www.ecoanxiety.com/>  
<https://www.psychologyforasafeclimate.org/>  
[https://www.acf.org.au/take\\_care](https://www.acf.org.au/take_care)



Global Peace Project



Global Sanitation and Sustainability Project



Global Road Safety Project



Global Entrepreneurship Project



Global Climate Action Project



Global Water Management Project



Global Air Quality Project

# THANK YOU



## Any Questions?



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