Efficiency of water management, key to sustainable food production

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Sources and use of water

Agriculture fishery

drinking-water

nature and recreation

groundwater

surface-water

Rain water

industrial use

domestic use / sanitation

seawater

Navigation / transport

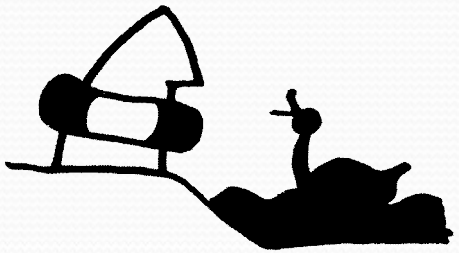
competition

- drinking-water / household use (1%)
- domestic use / sanitation (9 %)

(water consumption per capita: 350 m3 in 1900

642 m3 in 2000 on average, per person, per year)

- agriculture (70%)
- navigation / transport
- industrial use (20%)
- nature and recreation



competition

unsustainable water usage due to

- — higher household usage
- — urbanization
- — irrigation
- — changing diet patterns

Number of people living in countries chronically short of water:

- — 2000: half a billion (out of six billion)
- — 2050: four billion (out of nine billion)

(Source: Clarke and King (2004))

Food production: water quantity

agriculture (70% of fresh water)

- Method:
  - Irrigation spray (25% loss), drip (10% loss)
  - Rainwater –fed
  - grey water
  - time of day – amounts
- Crop choices
  - Non-domestic
  - Biomass / bio fuels
- pricing

Food production: water quantity

- food industry
- Transport (energy, pollution)
- Virtual water: the volume of freshwater used to produce the product, measured at the place where the product was actually produced". Sum of the water use in the various steps of the production chain. real water used to grow it is no longer actually contained in the product.
  - Glass of wine: 120 liters of water, hamburger 2.400 liters, a cotton shirt 4.000 liters ;
    Read more: http://www.lenntech.com/water-food-agriculture.htm#ixzz0RlS9usIy

Food production: Water Quality

- Pollution – fertilizers, pesticides
  - Water treatment : Waste water purification, re-use
  - Organic agriculture/ Ecological / bio – agriculture
  - Insects
- Biodiversity
- Climate change

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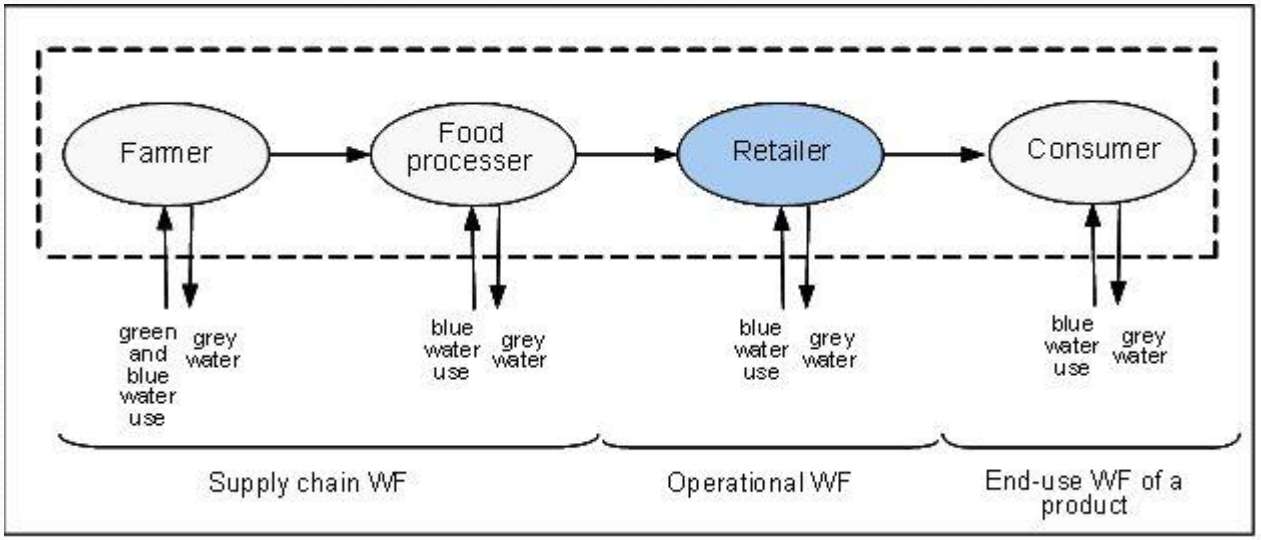
Food habits / diet / cooking

- Nutrition advise / diet
- Status / marketing:
  - Non-domestic crops/ food
  - (Wealth) Meat consumption
- Availability
  - Transport
- Preparation:
  - “food safety” >> water use / “waste” water

Understand and possible solutions

- Awareness: Water foot print http://www.waterfootprint.org
- the operational water footprint, i.e. the direct water use by the business in its own operations
- the supply-chain water footprint, i.e. the water use in the business's supply chain
- CGIAR: http://www.waterandfood.org/about-cpwf.html
  - plant-breeding solutions
  - ecosystem goods and services
  - Water system management

Water footprint



Water Vision

Water footprint

- Water Vision
- Aquawareness: European Water Awareness Program: a water saving and water efficient culture among political decision makers, key stakeholders and inhabitants
- Water stewardship: www.ewp.eu/projects/aquawareness/water-stewardship

Understand and possible solutions

- Capacity development & education:
  - sustainable practices in pre-harvest and postharvest agricultural activities
  - Water usage
  - Crop choices
  - Teach other cooking methods (2/3 less water?)
- Eat seasonal / local
- Aquawareness: Water Dialogues
- Participation: involve women, youth, indigenous peoples

Concluding

We cannot expect mankind to change its eating habits overnight or “deny” them a balanced diet , so it is evident that

- the agriculture and water sector have to join forces
- and drastically reduce the use of water to produce our future food requirements by at least 50%
- Dieticians, food industry , higher education and restaurants have to join forces and change the way we prepare food and eat.