Sharing Smart Cities

POPULATION, CLIMATE AND ROADS TO GREEN GROWTH

Sharon Brown

The University Of Queensland
AUSTRALIA

Highlights

- Urban – rural linkages
- Population and agriculture
- Resource constraints
- Climate change
- Green growth economy
- Smart agriculture linkages with smart cities

City pressures and solutions

35% of city residents have high anxiety levels.

Parks and street trees:

- improves emotional and physical health
- Improves air quality
- Reduces heat island effect

Community gardens:

- improves environmental awareness
- improves food security
- reduces food price

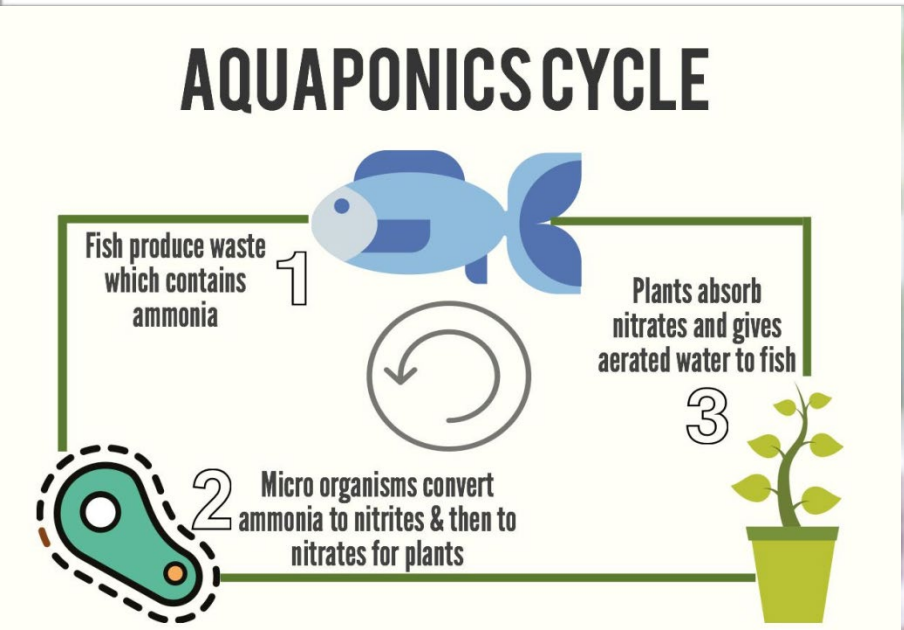
Greening buildings:

- efficient use of land, materials, energy, water

Green roof tops:

- reduces storm runoff

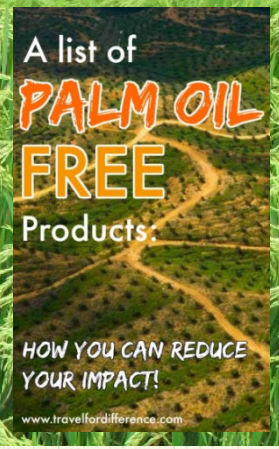
IoT - Smart indoor gardening

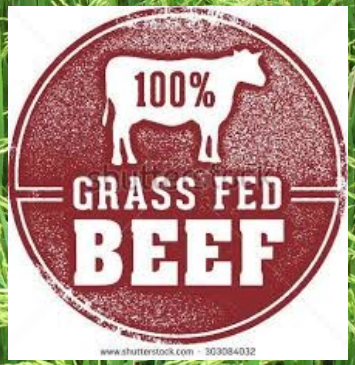


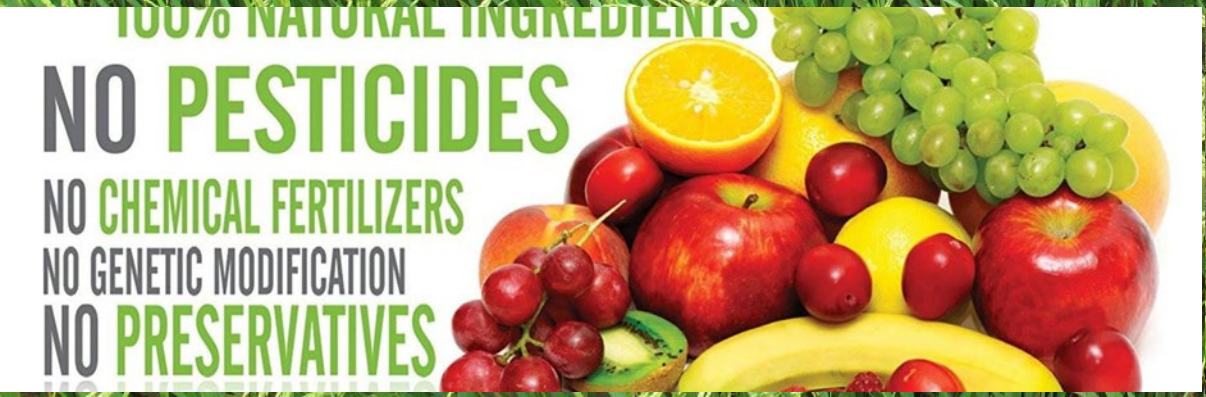
Cities and food

Food debates - protests

c. 80% consumers prefer sustainable products







Trust – food scandals

Honey laundering: fakes reveale

EXCLUSIVE

Adele Ferguson
Chris Gillett

Australia's biggest listed honey company and some of the country's largest supermarket chains face accusations of selling fake honey.

Testing at a leading international scientific lab that specialises in honey fraud detection has found almost half the samples selected from supermarket shelves were "adulterated", meaning the honey had been mixed with other substances. The adulterated samples were all products that blend local and imported honey.

Capilano's Allowrie branded Mixed Blossom Honey, which

Adulterat honey has found in Australian supermar

sources honey from Australi overseas and markets itself per cent honey, showed "adulterated" in the major

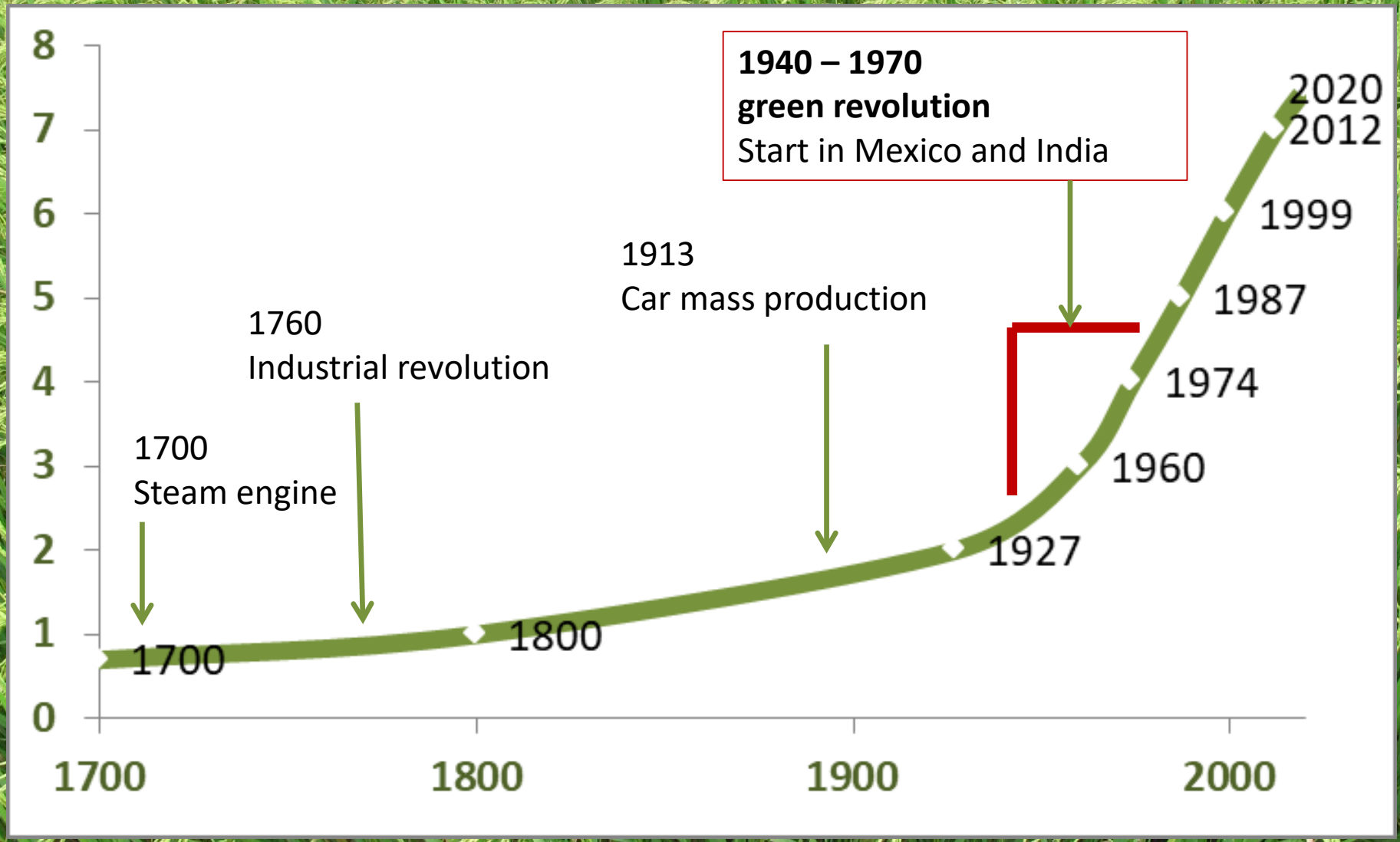
Continued Page 8

China melamine in milk

Horse meat scandal

Recent history of agriculture

Population
(Billion people)



The Green Revolution

Global cooperation in

science and technology

to provide global food security

High yielding crop varieties

Chemicals - fertilizer and pesticides

Irrigation

Mechanisation

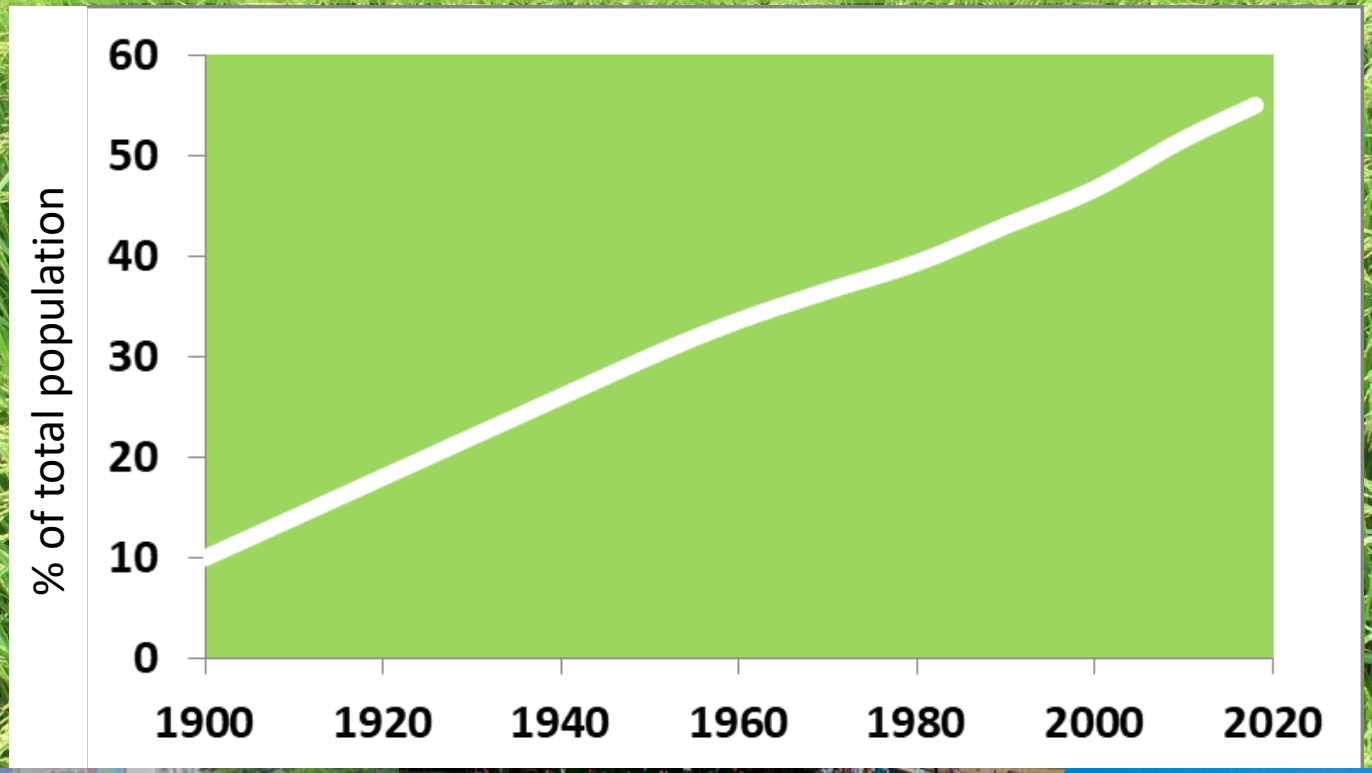
Developing countries
Continued mixed cropping

Developed countries

changed to large scale monoculture

Labour needs reduced by 40%

Migration to Cities



Success – enough grain for all


Declining resources

Water pollution

Main contributors:

- 80% city waste water untreated
- agriculture waste

Water shortage

By 2025:
60% of the world will be “water-stressed”

Salinity

20% crop land lost

Soil erosion & soil pollution

Deforestation

Wind

Soil Erosion

Coastal

Water

Mining

Agriculture

Soil Pollution

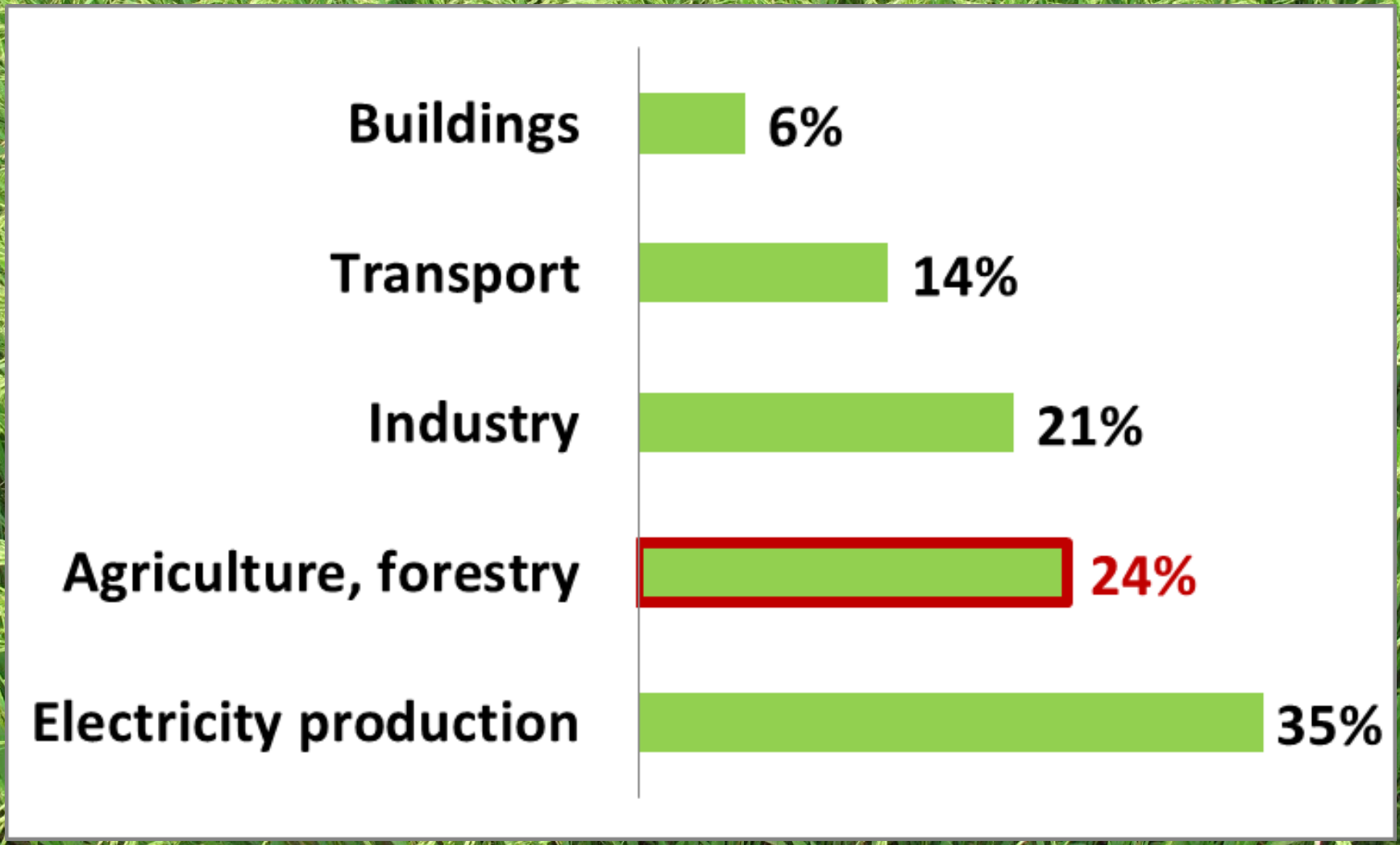
Household waste

Plastic

30% cropland lost


Climate Change

shared responsibility
Increased GHG emissions



Air pollution

- Crop residue fires – Deli

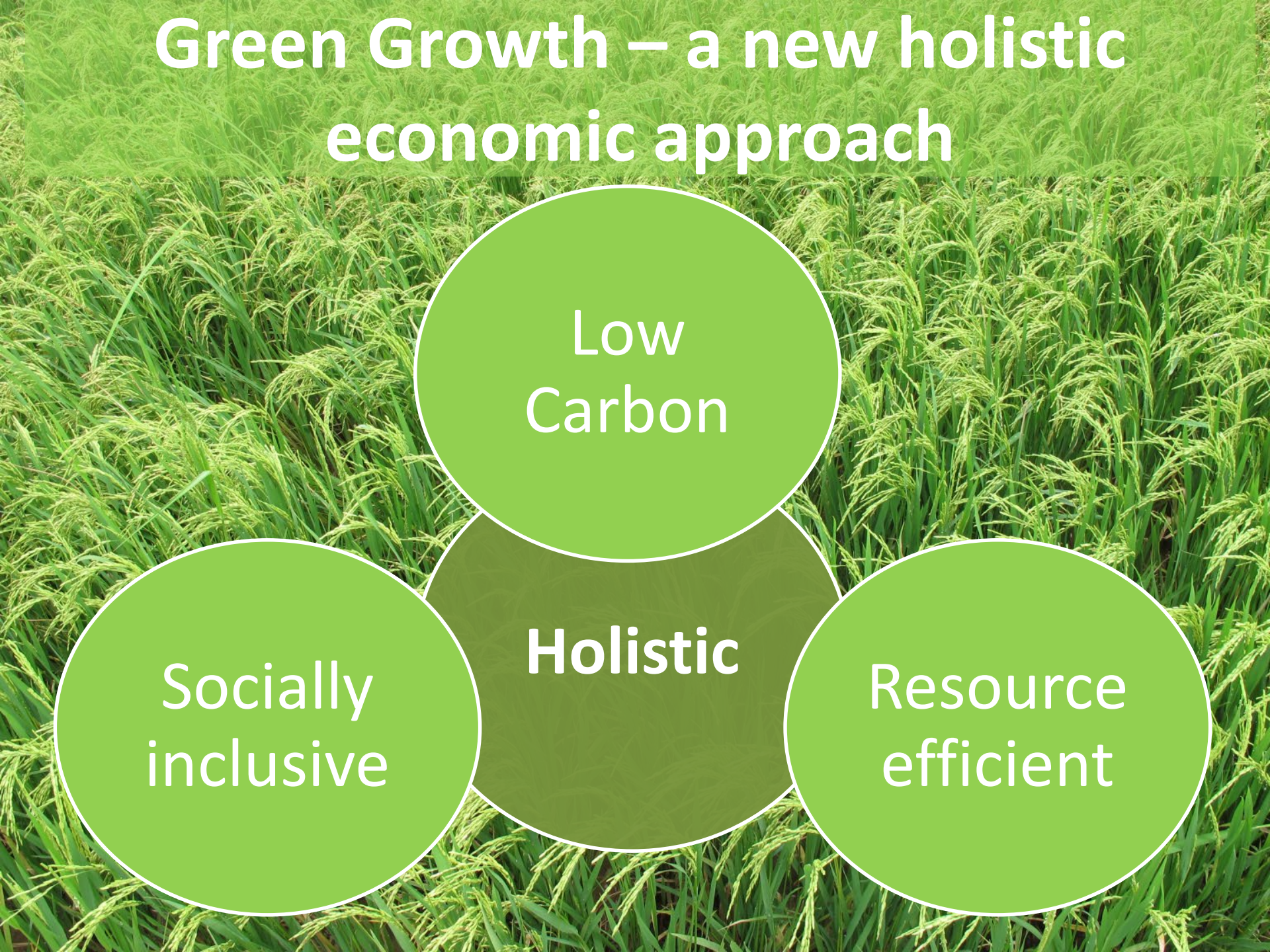


- Forest fires – Sydney



Need
Positive change

Green Growth – a new holistic economic approach



TODAY we need more innovators

Gottlieb Duttweiler – founder of Migros

Some key philosophies:

- 0.5% of revenue for social and cultural projects
- Organised as cooperatives (over 2million shareholders)
- All Swiss citizens can join and vote

Need Collaboration

Rural-urban links:

- sustainable agriculture
- sustainable eating

GG improve efficiency- food use

- 800 Million people undernourished
- 1.8 Billion adults overweight
- 30% of food production wasted


GG improve efficiency–
food production
50% more food needed by 2050

GG improve efficiency – energy use

Solar water pumps

Energy consumption:

- Direct – electricity, fuel
- Indirect - chemicals

Electric farm machines

Smart drones reduce inputs

GG improve – inclusion

80% of the worlds poor work in agriculture


Smart Agriculture:
Meet consumer demand
using
transformative approach

Develop sharing policies and strategies

- Smart:
  - mobility, transport
  - governance,
  - economy
- Use renewable energy technology

Use disruptive technologies

Internet of Things (IoT)

uses live data from sensors

Precision robots, drones reduce inputs:

- chemical
- water
- energy

Design research collaborations

that consider the needs of all stakeholders

- farmers
- consumers
- producer organisations
- farm suppliers
- business
- quarantine
- logistics & transport
- manufacturers
- retailers
- smart technology & big data
- government & policy NGOs
- enforcement
- start ups
- health professionals
- tourism
- education & capacity
- Professionals in ethics and social
- researchers
- scientists
- arts and history

Need
Enabling environments

- **Ethics in smart cities:** promote safety in products; GMO; transparency
- **Healthcare and human wellbeing:** influence consumers to consider nutrition

Need
Disruptive technologies

Changing demand for:

- **Alternative proteins:** plant-based meat substitutes; edible insects

- **Food sensing technologies:** test for food quality; prevent food fraud

Need

Value chain linkages to promote trust

- **Big data and analytics will:** promote service delivery
- **Internet of things will:** collect food product data along the supply chain
- **Block-chain enabled traceability will:**
  - enable easy sharing
  - store transaction data
  - aggregate and analyse data
  - provide transparency to justify cost of food

Conclusions

Goal:

People centered sustainable innovations

Solutions:

- **The Green Growth economic model**
- **Linking smart agriculture and smart cities through sharing of:**
  - resources
  - Ideas, research
  - policy development
  - communication


Thank You