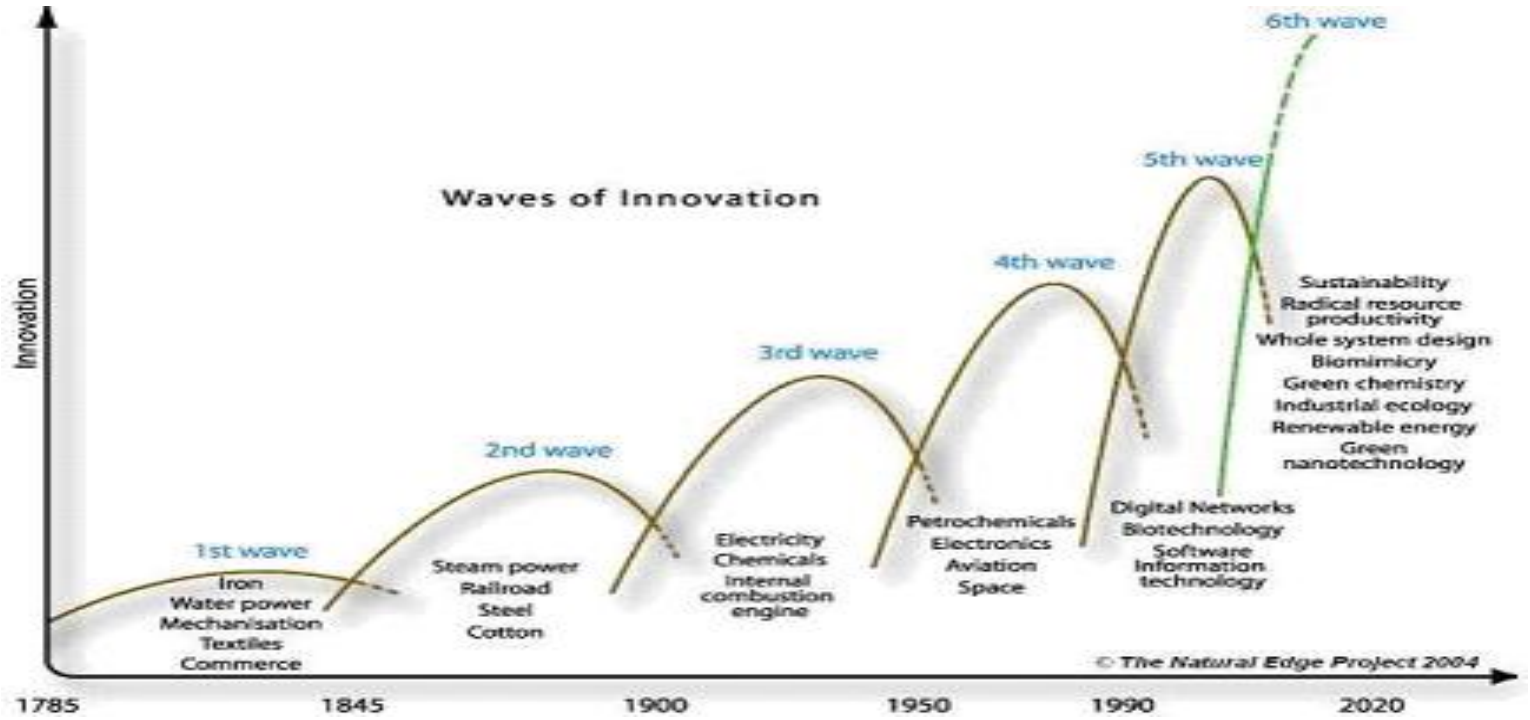
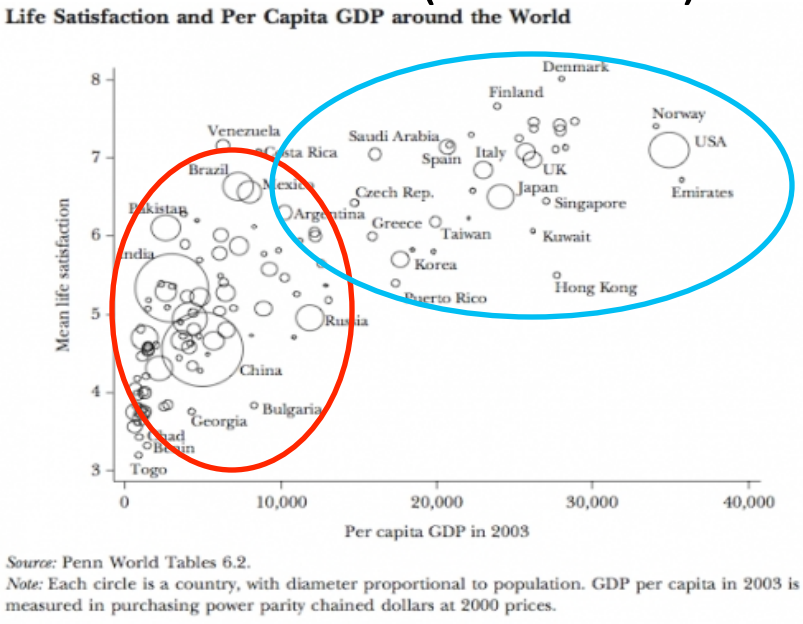
Natural blends, Sustainable Innovations and Income growth

Yoram Krozer and Han Brezet, University Twente – CSTM, Technical University Delft – DfS, Sustainable Innovations Academy, 12-6-2012



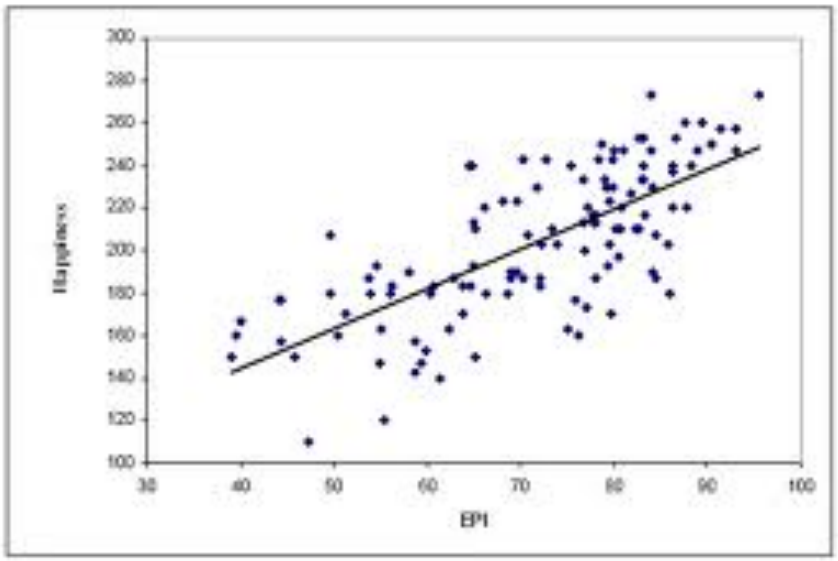
Income and environment for prosperity

Income (GDP) & satisfaction (countries)



Source: Penn World Tables 6.2.
Note: Each circle is a country, with diameter proportional to population. GDP per capita in 2003 is measured in purchasing power parity chained dollars at 2000 prices.

Eco-footprint & satisfaction (countries)



See: NEF, The Happy Planet, Index 2
http://www.economonitor.com/blog/2008/02/happiness-map/

Prosperity growth possible in theory

Ongoing debate: limits to grow (e.g. Club of Rome 1972, Blueprint for survival, 1972) viz sustainable innovations (e.g. Kuipers & Nentjes, 1973; Solow, 1974, WCED 1987).

Assume (after Erlich) I = P A T; I impact, P population, A affluency per person, T technology & lifestyle

P x A satisfy global demands given scarcities, if, T, annually 3% less material and pollution per labor unit and 5% more renewable energy (e.g. the EU approached this in the past decade).

Challenges in practices

- Population grows to fast, but the growth rate decreases due to more "women power"
- Wealth is unfairly distributed, but prosperity increases within and across countries
- Impacts are often beyond the Earth limits, but sustainable innovators (eco-innovators) emerge

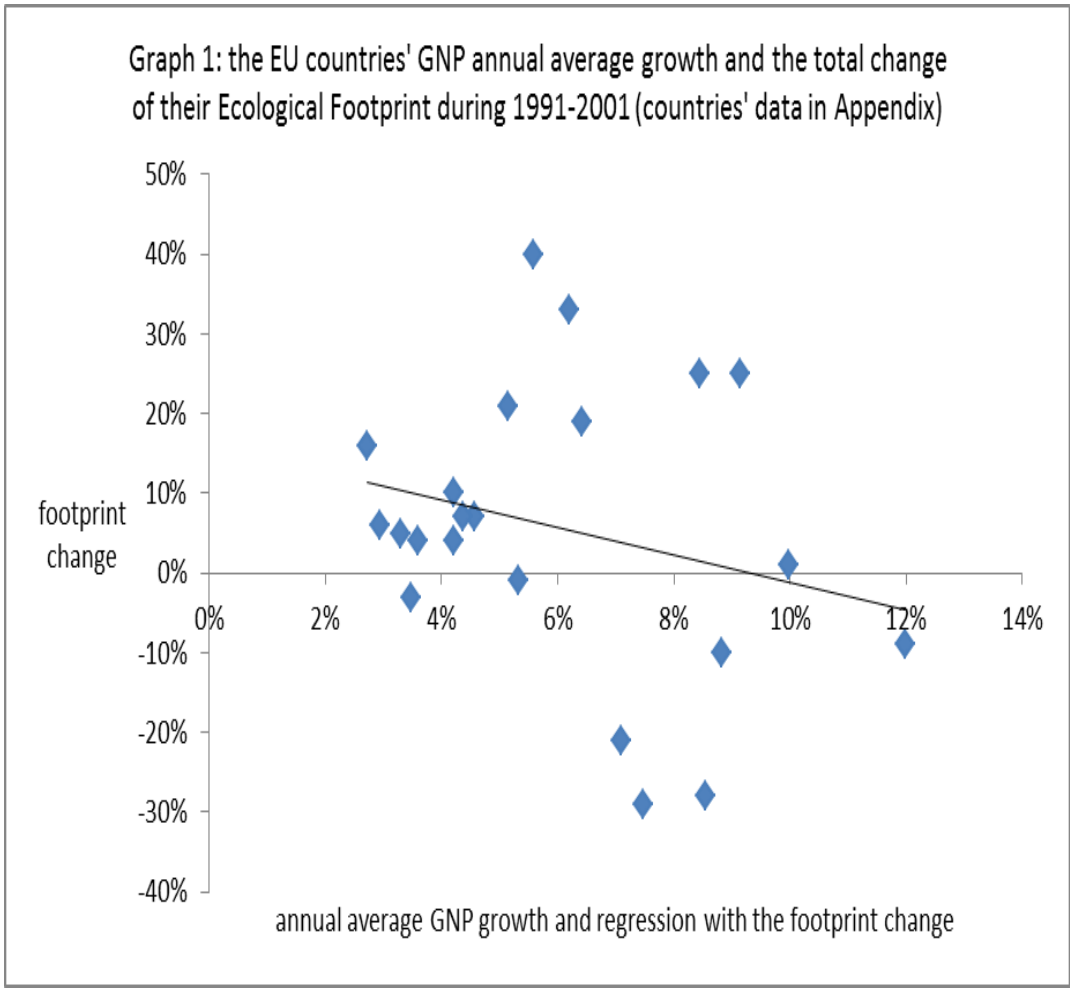
The situation is critical despite encouraging trends

Production & consumption need forced corrections

Some achievements so far

Time	**Focal issues**	**Concepts & Actions**
sixties	Health	Infra-structure
seventies	Pollution	Clean technology
eighties	Consuming	Eco-design, Life cycle
nineties	Resources	Eco-efficiency
recently	Behaviour	Sustainable Innovations

Corrections ongoing but imperfect



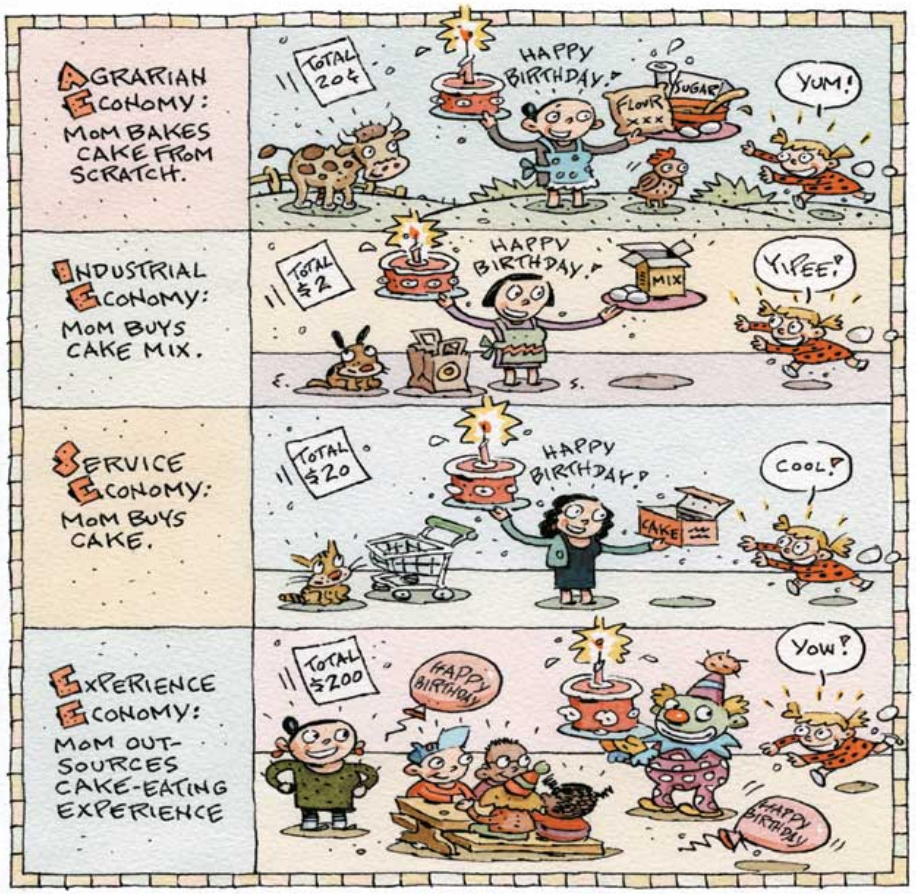
Globe: income grows faster than materials (relative decoupling)

EU: some countries' income grows at a smaller eco-footprint (absolute decoupling)

Corrections progress albeit too slow

Decoupling due to shifts:
- Labor for materials
- Know-how for handwork
- Leisure time for work
- Environment for quality

after Drucker 1986



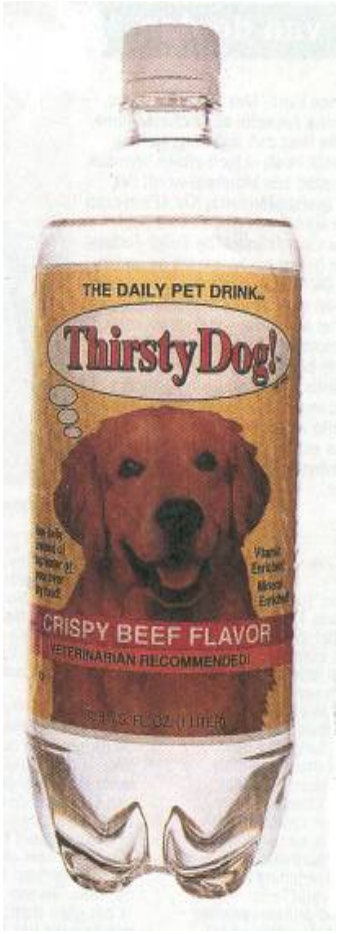
Demands for environment related to the growing class of knowledge workers (0% to 30% of labor in 150 years)

Demands for nature-culture services

We pay a lot for such services:

- Bottle water 50x dearer than tap
- City gardens 100x dearer of rural
- 'Health' food fastest growing food
- Billions for wellness and "slow" time
- National Parks up to € 150/visitor-day
- Discovery channel, Ambient music
- Animal watching, eco-trails, etc.

International tourism provides services for 800 million people that pay > 500 billion euro a year (2nd largest business)



Happy Puppy for
€ 200/m^3 bottle
€ 1/m^3 tap

Demands for loss prevention

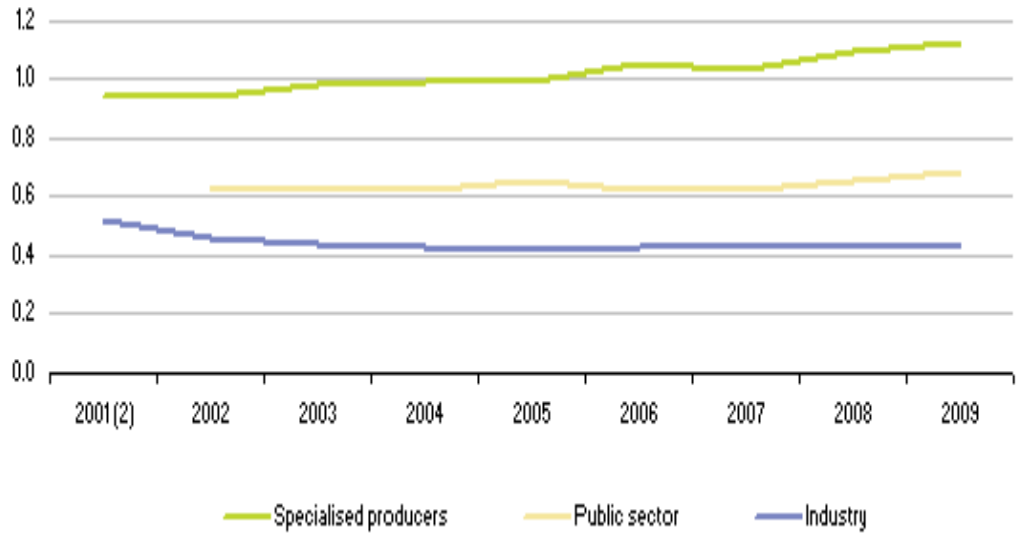
Cost covering loss prevention (examples):

- Processes, e.g. paper saving for office work
- Products, e.g. fuel saving for cars
- Value chains, e.g. better packing for foods
- Regions, e.g. noise preventions for health
- Sectors, e.g. home-work for de-congestion

Prosperity loss due to the impacts is 5% - 8% GNP

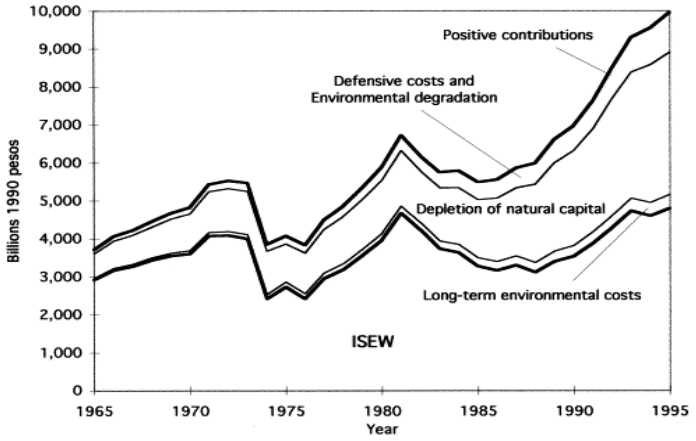
Could be no real income growth after correction for environment

Demands for environment protection



Chile's environmental protection grows faster than the losses Beatriz E Castañeda, Index of Sustainable Economic Welfare

EU expenditures in % GNP: environmental sector, public sector, industry (Eurostat data)



Agenda for policy making

Necessary to create:

- Social sense of urgency through NGO support
- Level-playing field for sustainability innovators
- Compliance with rules of law for all interests

  Enforce the rule of law:

  - Strict targets with fair emission trading
  - Environmental Management Systems
  - On-line monitoring of compliance

  Environmentor projects shows: ICT can support legislature and save a few billion euro's in the EU

Agenda for social entrepreneurship

- Authorities: ecological modernization of finance
- Businesses: downscaling of technologies
- Communities: beneficial localized economies
- Innovators: distributed, co-operative systems
- Individuals: engagement and creativity training

Social entrepreneurs foster social changes through morality in innovations (e.g. Latour's "engineering scripts", van Leeuwen Unilever's "translating ethics in techniques", Achterhuis' "moralising equipment"

Metissage in water

Examples of the services that blend water with culture

Ongoing and possible

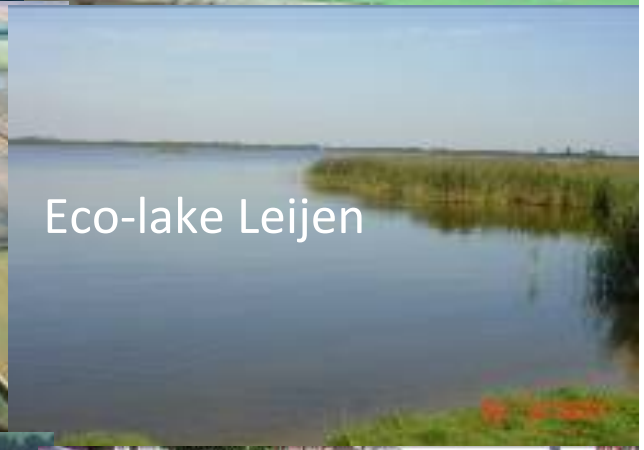
Thanks to Natalia Lucía Agudelo Álvarez

Cultural waterway E27

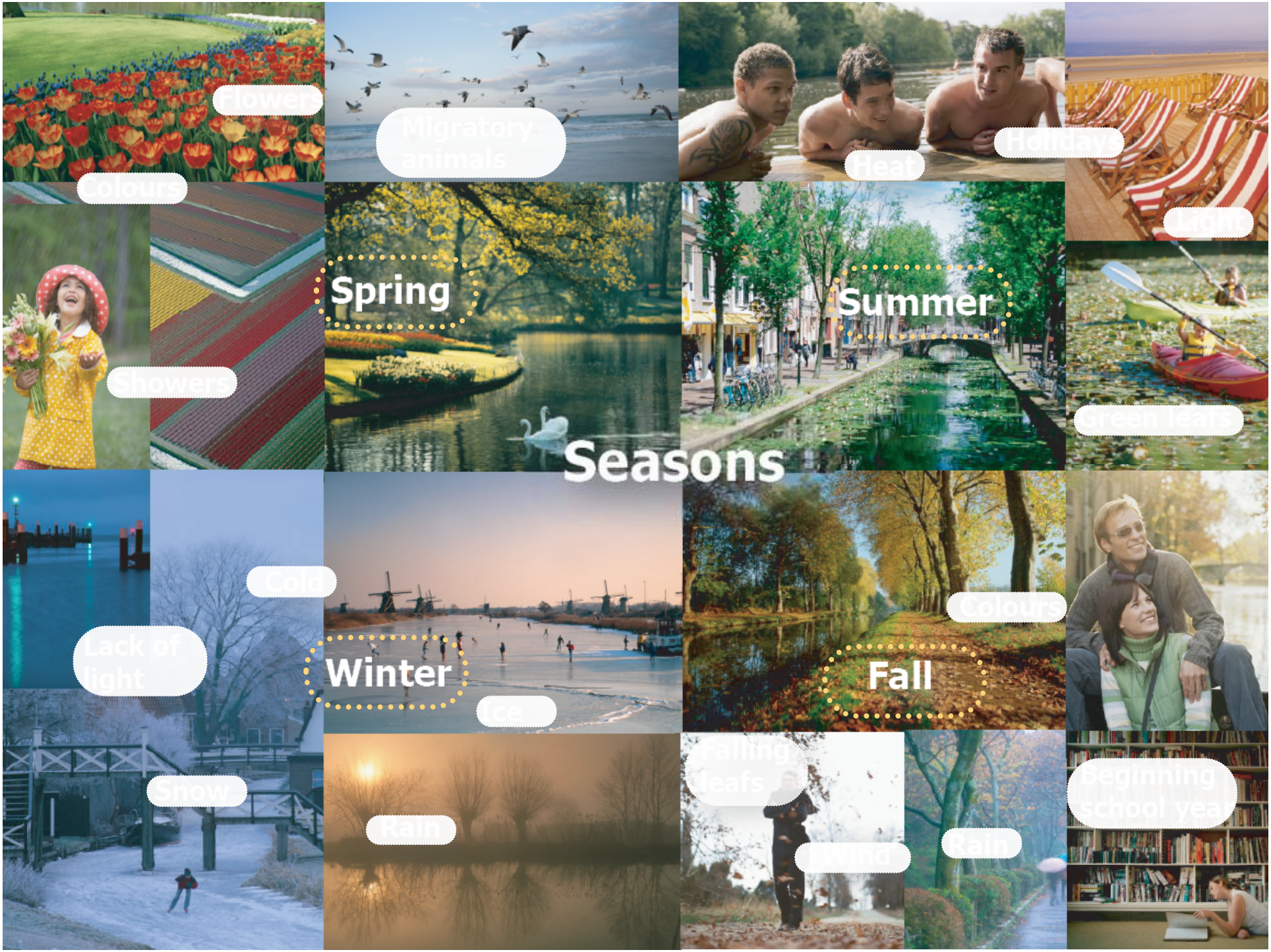
Enabling nature

City Nature services

Sewage park



Eco-lake Leijen


Flowers
Colours
Migratory animals
Heat
Holidays
Light
Showers
Spring
Summer
Green leafs
Seasons
Cold
Lack of light
Winter
Ice
Colours
Fall
Snow
Rain
Falling leafs
Wind
Rain
Beginning school year


Seniors
Families
Individuals
Party
Lights
Night life
Adults
Landmarks
Museums
People
Groups
Young
Sightseeing
Tourism
Entertainment
Kids
Open
Knowledge
Shopping
Sports
Active
Curious
Boats
Skate
Sky
Windsurf


Shops
Bridges
Lake
Boats
Sidewalks
Pedestrians
Social interaction
City
chairs
Surroudings
Canals
Camping
Floating houses
Insects
Fish
Life
Plants
Birds

Thank you for your patience