

Permaculture

Solutions for the Energy Descent Future

by David Holmgren

All Seasons PDC March 2009

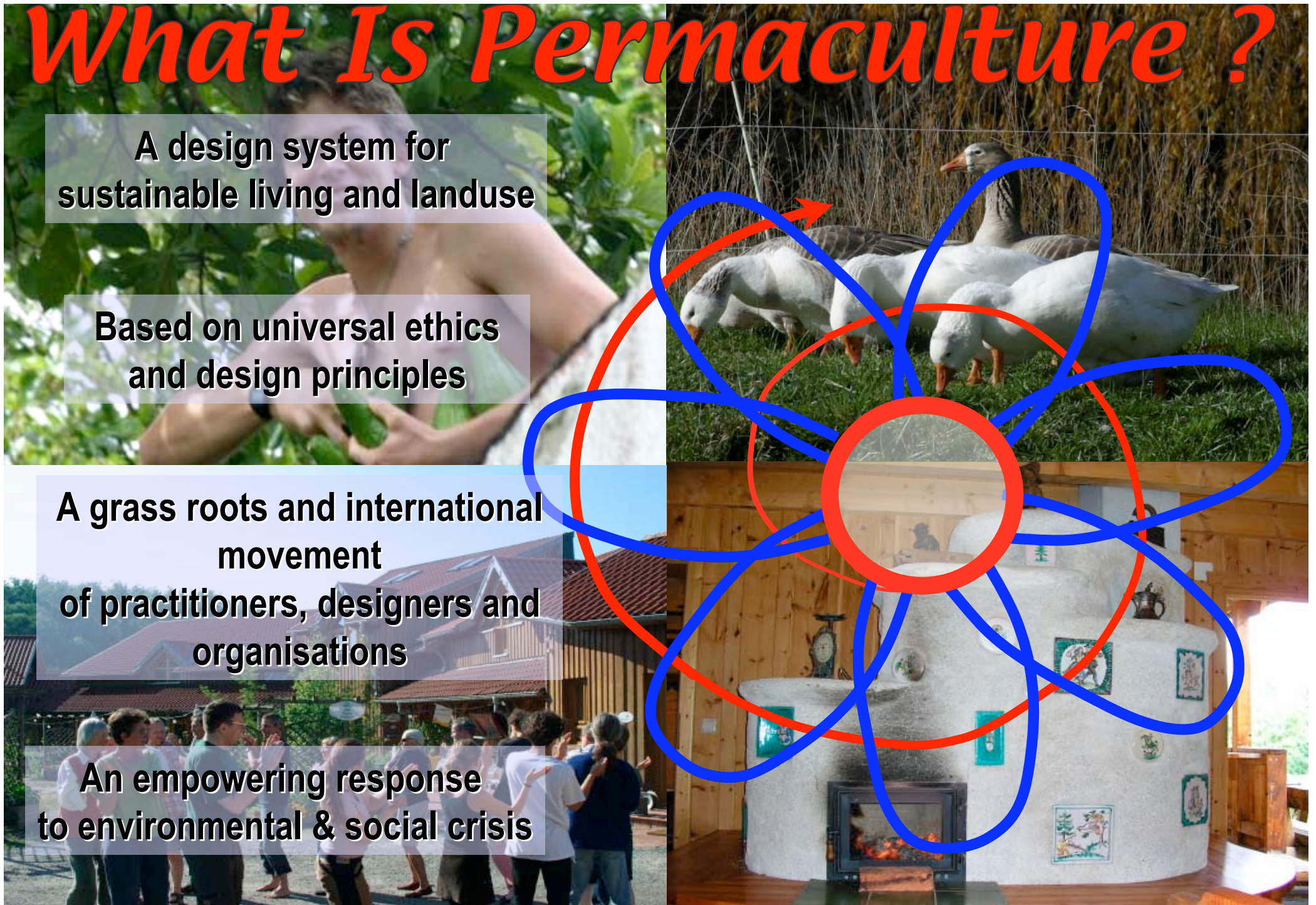
What Is Permaculture ?

**A design system for
sustainable living and landuse**

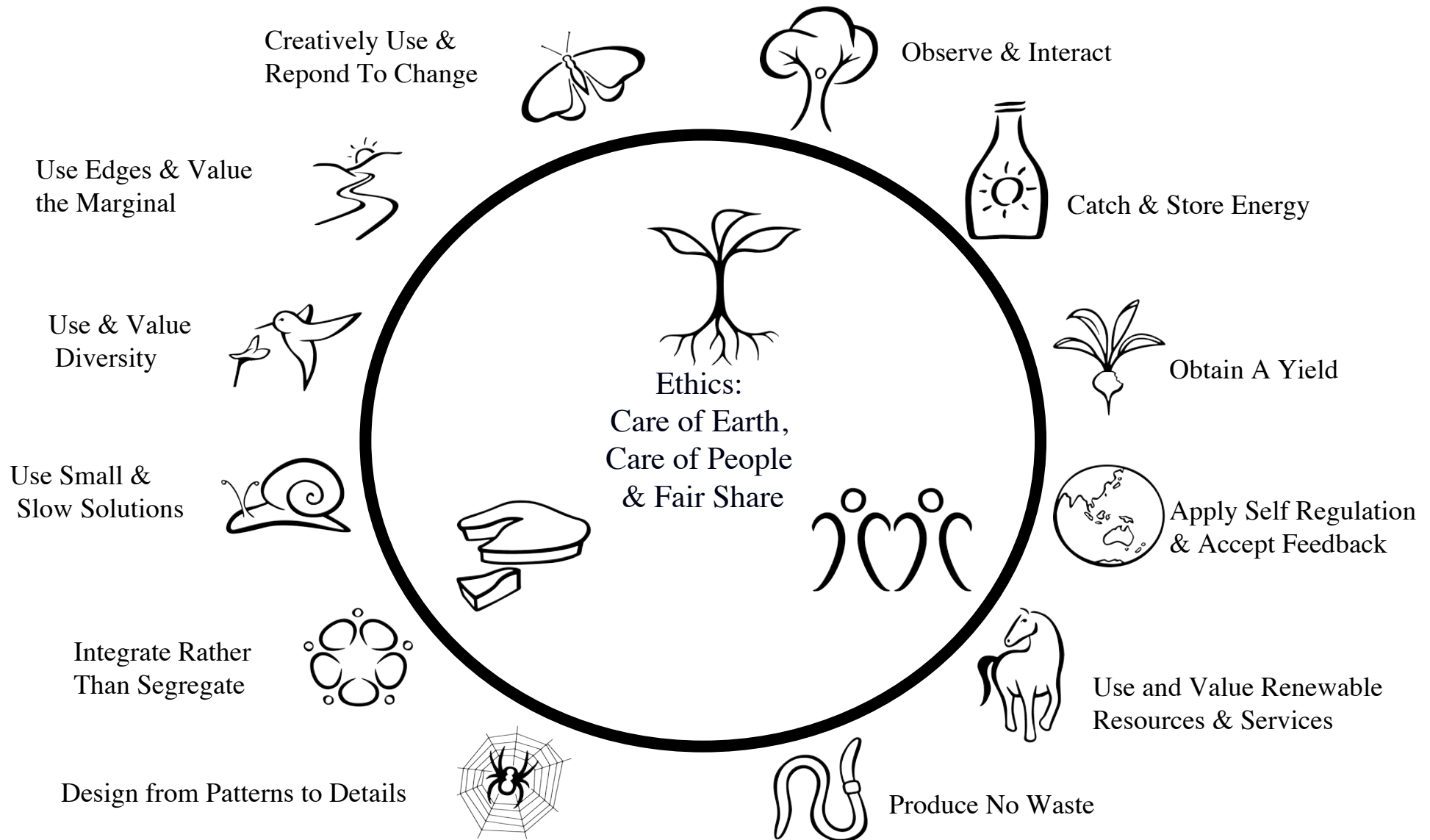
**Based on universal ethics
and design principles**

**A grass roots and international
movement
of practitioners, designers and
organisations**

**An empowering response
to environmental & social crisis**

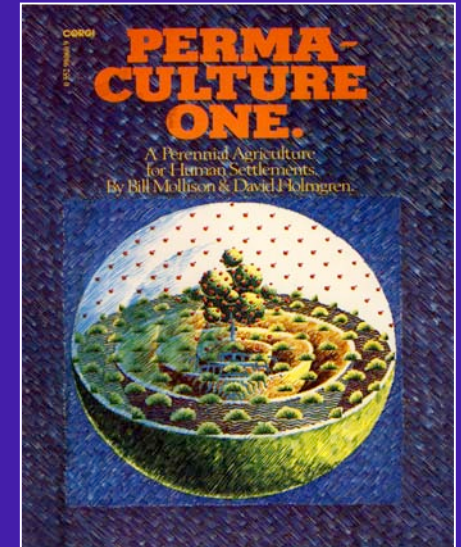


Permaculture Ethics & Design Principles

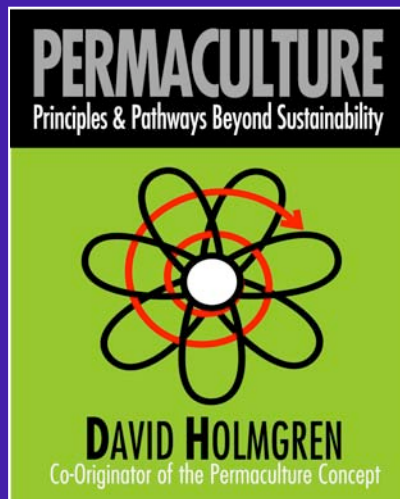
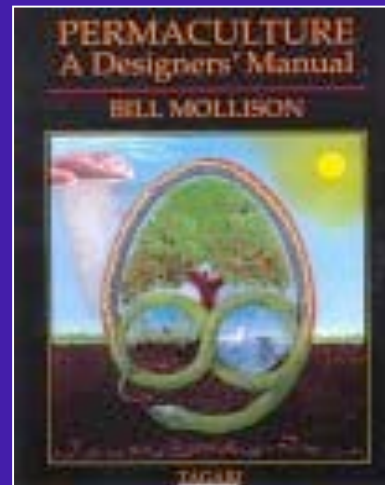


Permaculture: the history

Permaculture One (1978)
Bill Mollison & David Holmgren



Permaculture: A Designers' Manual
(1988) Bill Mollison



Permaculture: Principles and Pathways Beyond Sustainability
(2002) David Holmgren

Environmental & Social Crisis?

Environmental

- Climate change (already happening)
- Land degradation (continuing)
- Infrastructure decline (advanced)
- Resource depletion (global oil peak)



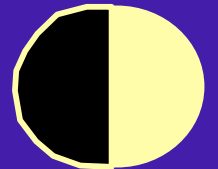
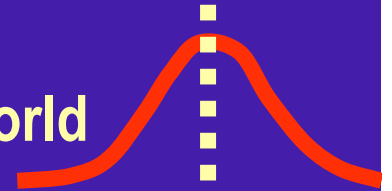
Social

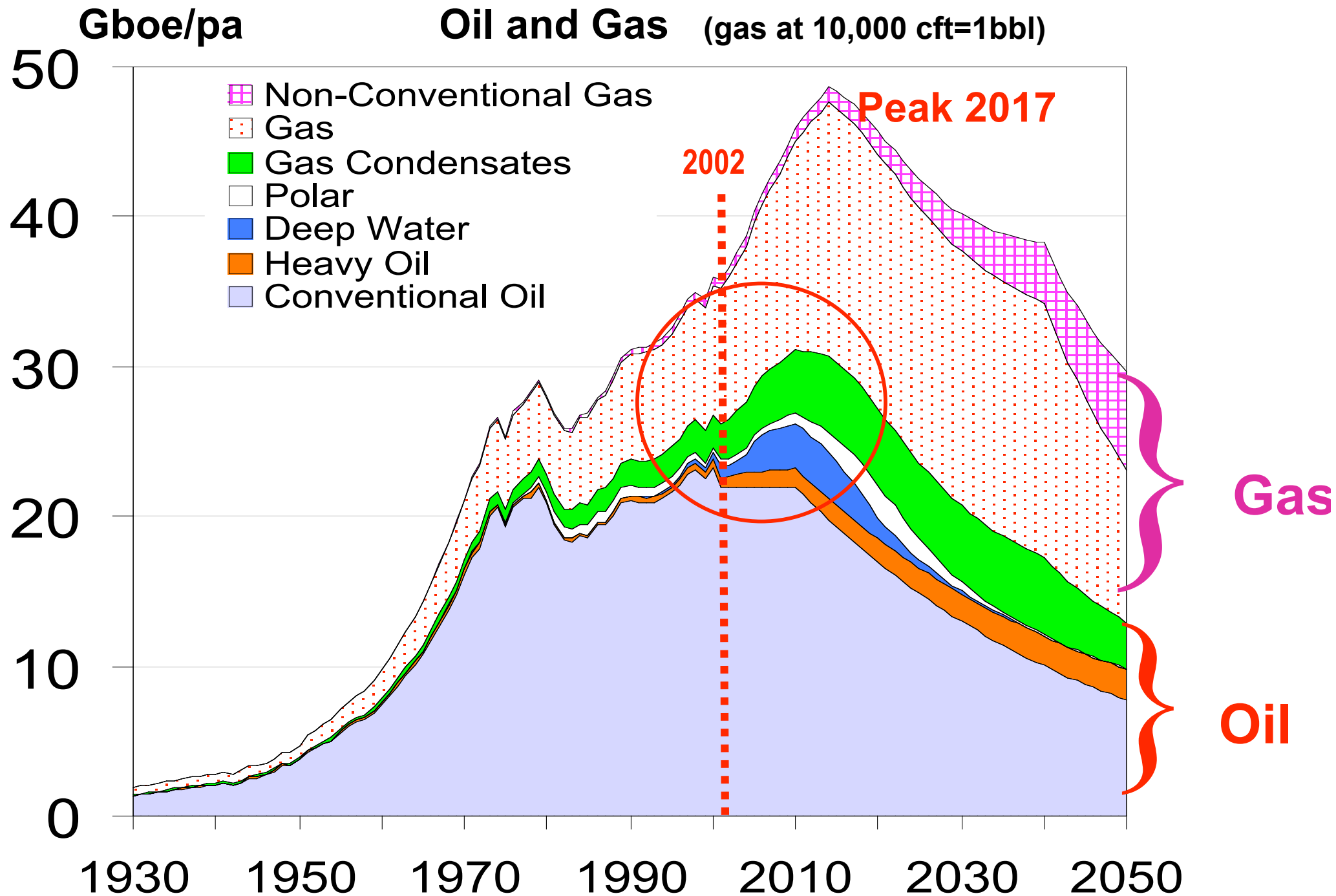
- Family & community breakdown
- Addictive behaviours
- National & household debt (unprecedented)
- Corporate scandals, criminal economies
- Illusion and deception, neo-fascist solutions



What Is Peak Oil ?

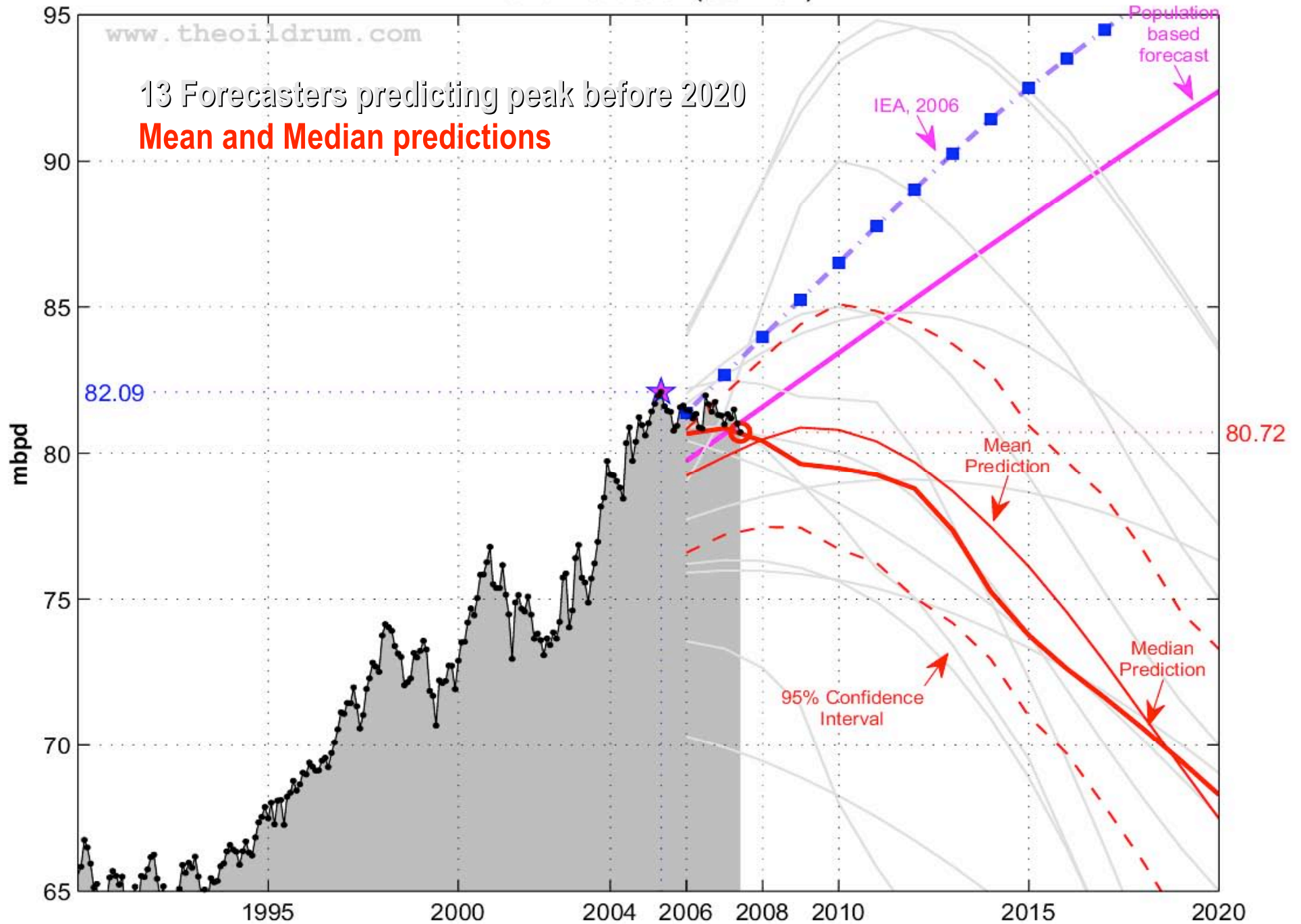
- Point of maximum production of a field, a nation or the whole world
- Peak usually occurs when about half the total resource is used
- The easy, best quality and biggest fields are always tapped first
- Heavy, deep ocean and arctic oil can only mask the recent peak in conventional oil for a few years (at a higher cost)
 - Natural gas is the only high quality fuel with
 - high net energy returns which can substitute for oil
- Natural gas production peak will quickly follow oil peak



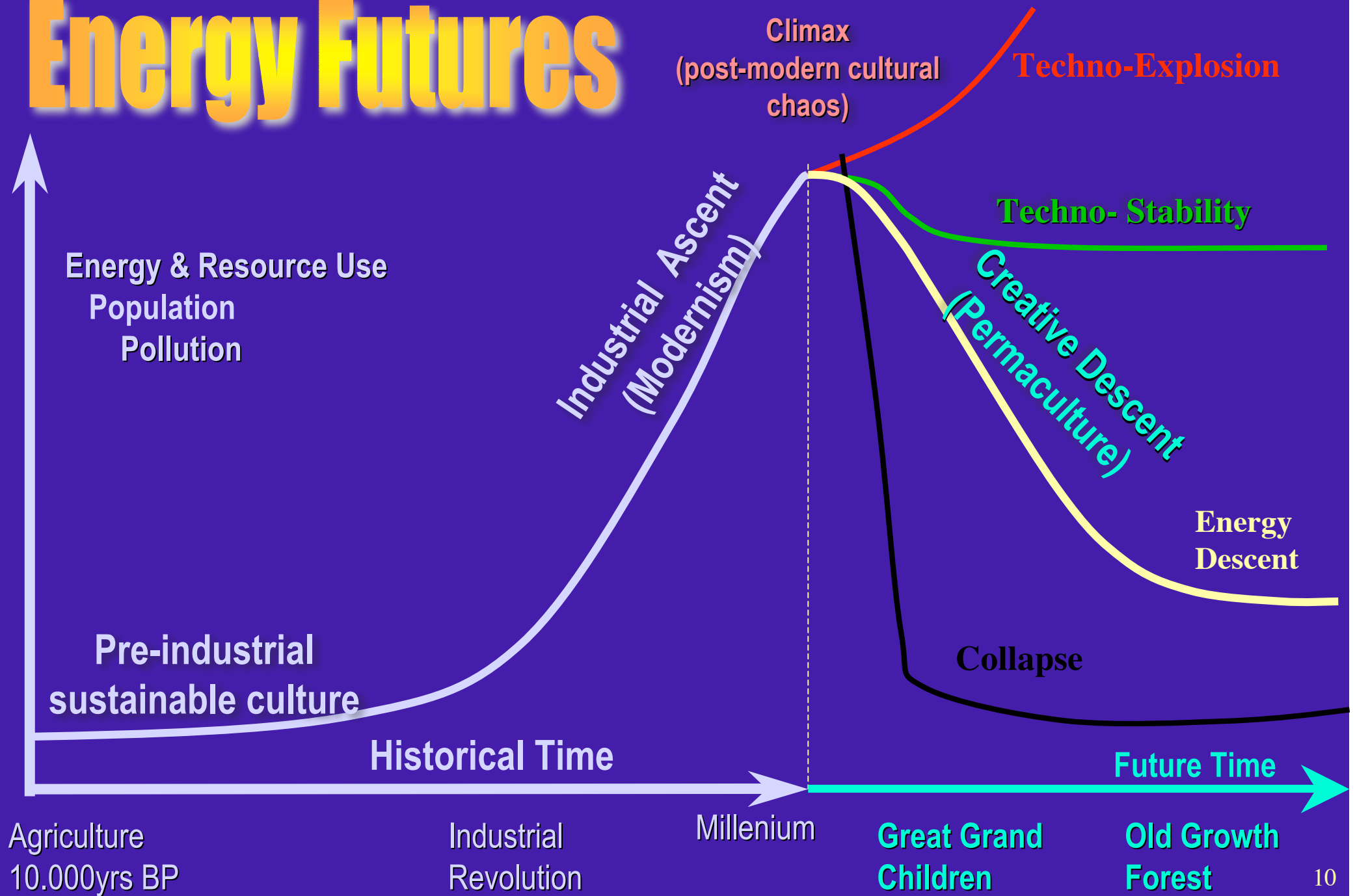


From ASPO "Statistical Review of World Oil and Gas, June 2002"

World Production (CO+NGL)

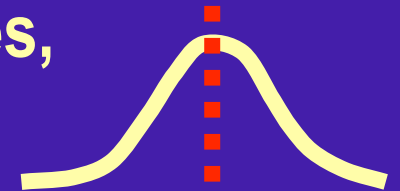


Energy Futures



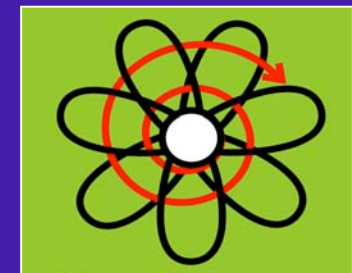
What Is Energy Descent?

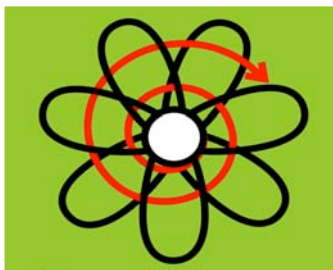
- **Decline in net energy available to support humanity**
(Net energy is energy profit after all direct & indirect costs of production are subtracted)
- **A gentle decline like a balloon coming back to earth as the most hopeful future.**
- **Mirrors energy ascent; very fast over several decades, and then more slowly over several centuries**
- **Rate of change appears greater due to radical change in direction**



Opportunities from energy descent

- Higher prices for natural resources ~~will~~ (are);
 - drive energy conservation and renewable energy development
 - boost agriculture and rural economies
 - allow low input & organic farming to compete against intensive land uses
- Reduced mobility of people and goods will;
 - make local products more competitive than imported ones
 - stimulate self-reliance, repair, retrofit & recycling
 - increase community interaction and exchange
 - restart household and local economies (Relocalisation)
- Relocalisation will shift power and respect for;
 - older and rural people with self reliance skills
 - people who can work physically
 - those applying permaculture principles





Permaculture Solutions for Energy Descent & Relocalisation



Garden agriculture for Food security, Health & Conservation



Kitchen garden raised beds Melliodora



Garden greens & vegetables,
greenhouse tomatoes



Harvesting pears



Potatoes: staple food
from the garden

Living Soil; the water & carbon bank for future food security

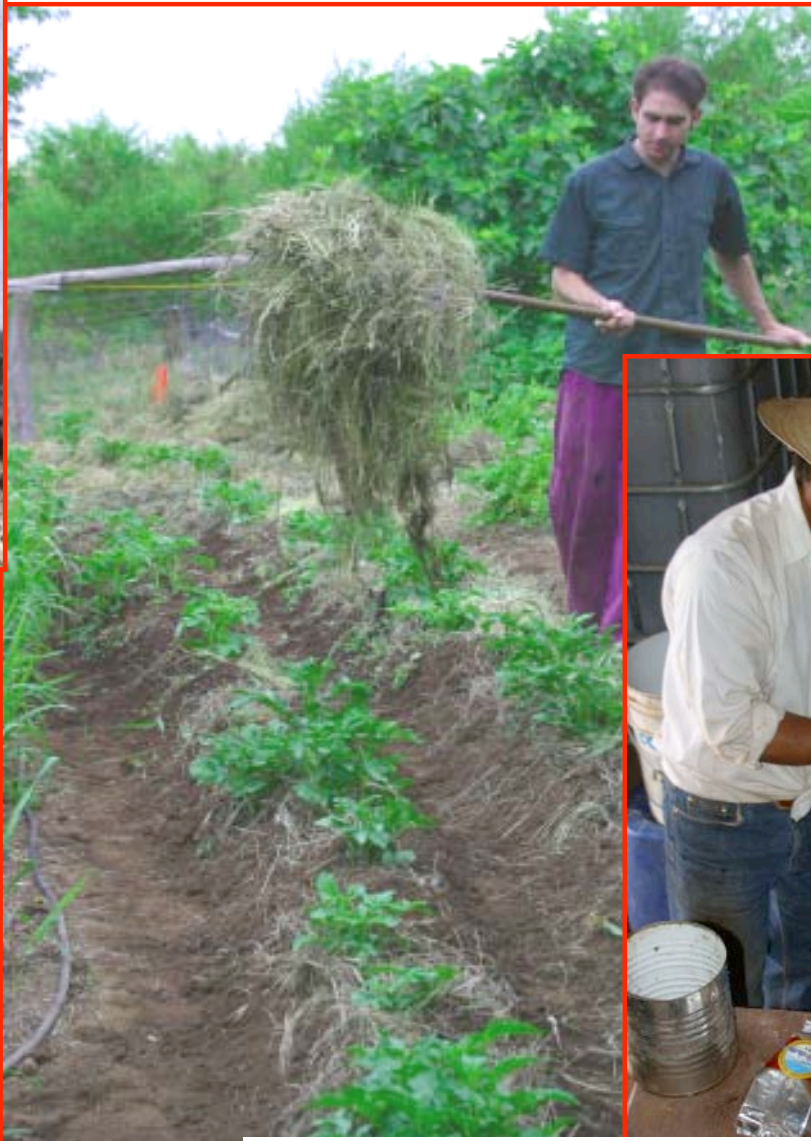


Organic Soil fertility building & maintenance

Chook deep litter
compost & worm farm



Mulching potatoes
with meadow hay



Hot Composting

Biofertiliser made from anerobic fermentation of
fresh cow manure used as a potent soil life
enhancer being made by local peasant farmers
Zacatecas Mexico



Biodiversity conservation & Seed saving

Heritage corn variety (North Carolina USA)



Koanga Gardens Seed Bank (New Zealand)



Polyculture Project Seed Bank
(Instituto De Permacultura Da Bahia, Brasil)

Local & Seasonal Food Culture



Pasta making with children

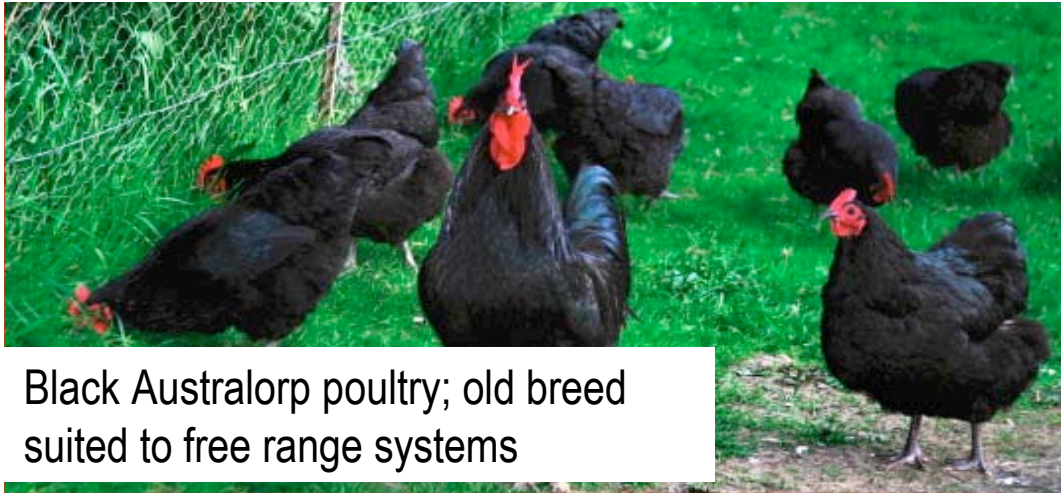


Sun drying fruit



Bottled fruit in earth cellar
(Planinca eco community Slovenia)

Working with animals: yields & ecological services



Black Australorp poultry; old breed suited to free range systems



Aigamo ducklings controlling pests and manuring in organic rice, Japan



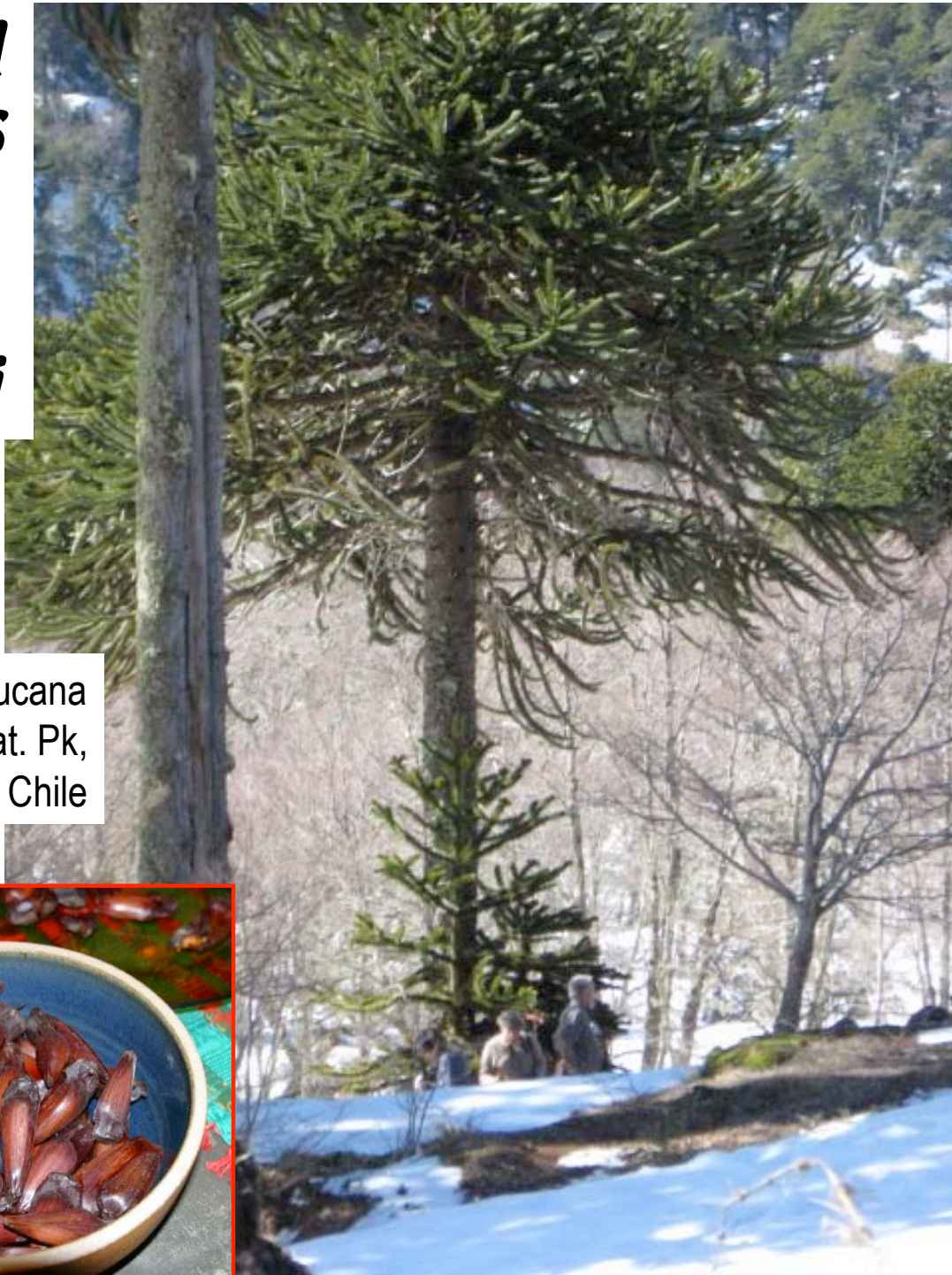
Milking goats: healthy food & living



"Pig tractor" in bamboo grove (Queensland, Australia)

Novel foods from trees & fungi

Araucaria araucana
Villarrica Nat. Pk,
1500m asl Chile



Shitake mushrooms on oak
(Swalmann Netherlands)

Agroforestry: agriculturally productive forests



Agroforestry system (Amambai MS Brasil)
design based on Ernst Götsch SAFS Photo Skye



Grow tubes protecting Carobs & other high value tree crops
in mounded beds, Anglesea Victoria

Use of wild abundance



Wild Douglas Fir (Twizel, New Zealand)
excellent sustainable timber



Moso bamboo (Kyushu, Japan)
sustainable fibre and food



Kangaroos (Hepburn, Australia)
healthy & sustainable meat

Ecological forestry



Carlos Caballero, pioneer ecological forester with restoration area he planted 40 years ago on eroded tepetata landscape “El Pardo”, Tlaxco, Tlax., Mexico

Thinning coppice regrowth Box forest forest
Fryers Forest Eco-village.



Energy from forest thinnings & wood wastes

Macrocarpa firewood stack Rainbow Valley Farm Matakana NZ



Austrian wood pellet furnace/solar central heating cabin, Kinsale Ireland



Ecological Building ***natural materials &*** ***climate control***

Passive solar design,
earth brick thermal mass & load bearing
walls, salvaged joinery & panelling timber
(Melliodora Australia)



Australian vernacular timber construction: Box
roundwood poles & stumps, sawn timber frame,
vertical board cladding and curved galvanised iron
roof (Melliodora, Australia)

Ecological retrofit of existing buildings

Warehouse retrofit to green office
60L Building Melbourne 2004



Attached solar greenhouse Styerberg Germany 1994

Ecological transport solutions

Motorbike “prime mover”
(Vietnam)
Photo Darren Doherty

Horse cart &
bicycle
(Botucatu Brasil)



Wood gasifier powered ute (Finland)



Carpooling & Hitchhiking
(Hepburn, Australia)

Water and nutrient harvesting



Galvanised
rainwater tank,
Melliodora



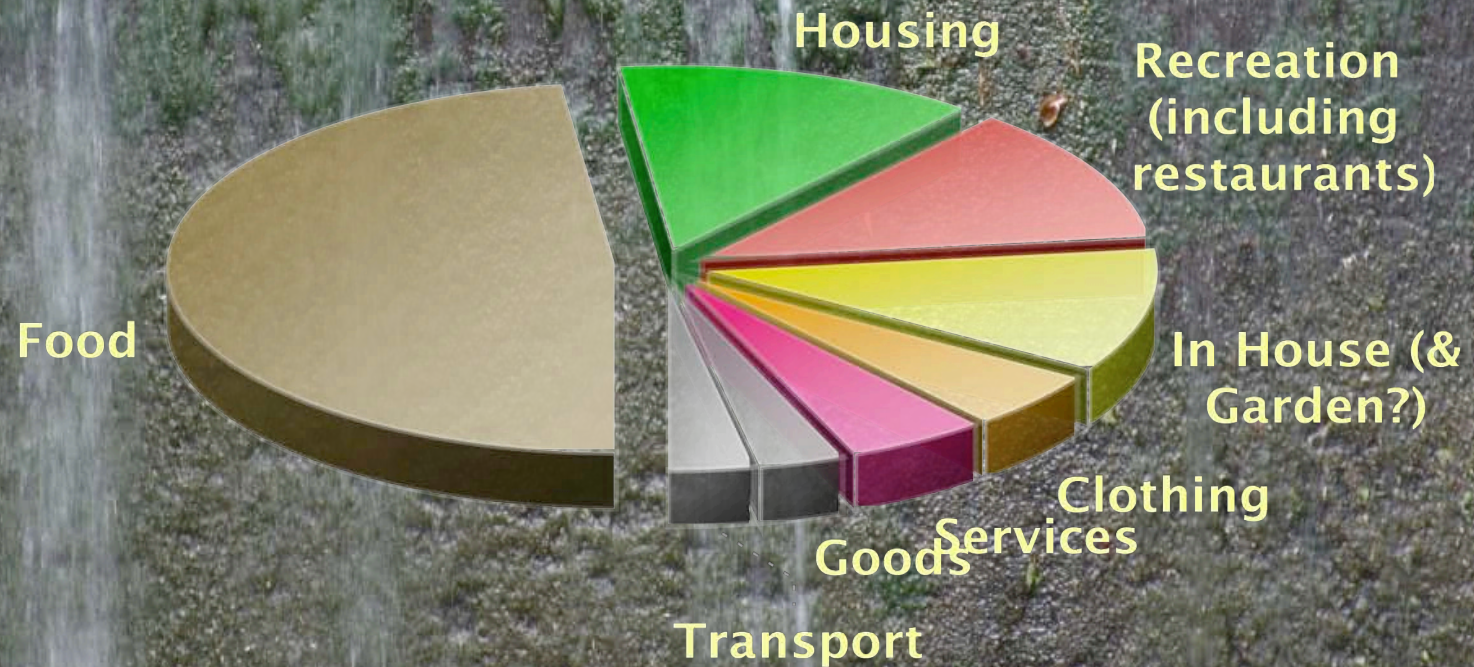
Gravel reed bed treating
grey water, (Fryers Forest, Australia)



Compost toilet, IPEC
(Pirenopolis GO Brasil)

What about water ?

**Total Water Budget for Average Sydney Household
(Lenzen & Foran 2001)**



Embodied Water

Selected good produced in Australia (Lenzen & Foran 2001)	Litres/\$ value	Melliodora
Rice (in the husk)	7459	
Seed cotton	1600	
Sugar cane	1239	(Honey) 2
Dairy products	680	(Goat dairy) 2
Wine	503	(Wine & juice) \approx 30
Beef products	381	(Eggs & Meat) 2
Fruit & Vegetables	103	20
Clothing	90	

Saving Water by using it !

- Grow food at home
 - Start with salads and perishable fruits
 - Other fruit and vegies
- Keep animals for eggs and meat
 - Poultry fed on wastes and wheat
 - Rabbits fed on grass and weeds
 - Bees for honey
- Home brewing and wine making
- A neighbourhood dairy
 - Preferably goats
 - Rainfed weeds. pasture & tree fodder
- Seasonal water allocation not water restrictions
 - Treat water users as adults
 - Just access for all to modest consumption, optional use at real prices



Creative Reuse & Recycling

Hand cranked sugar cane crusher made from electric motor armatures (Habana Cuba)

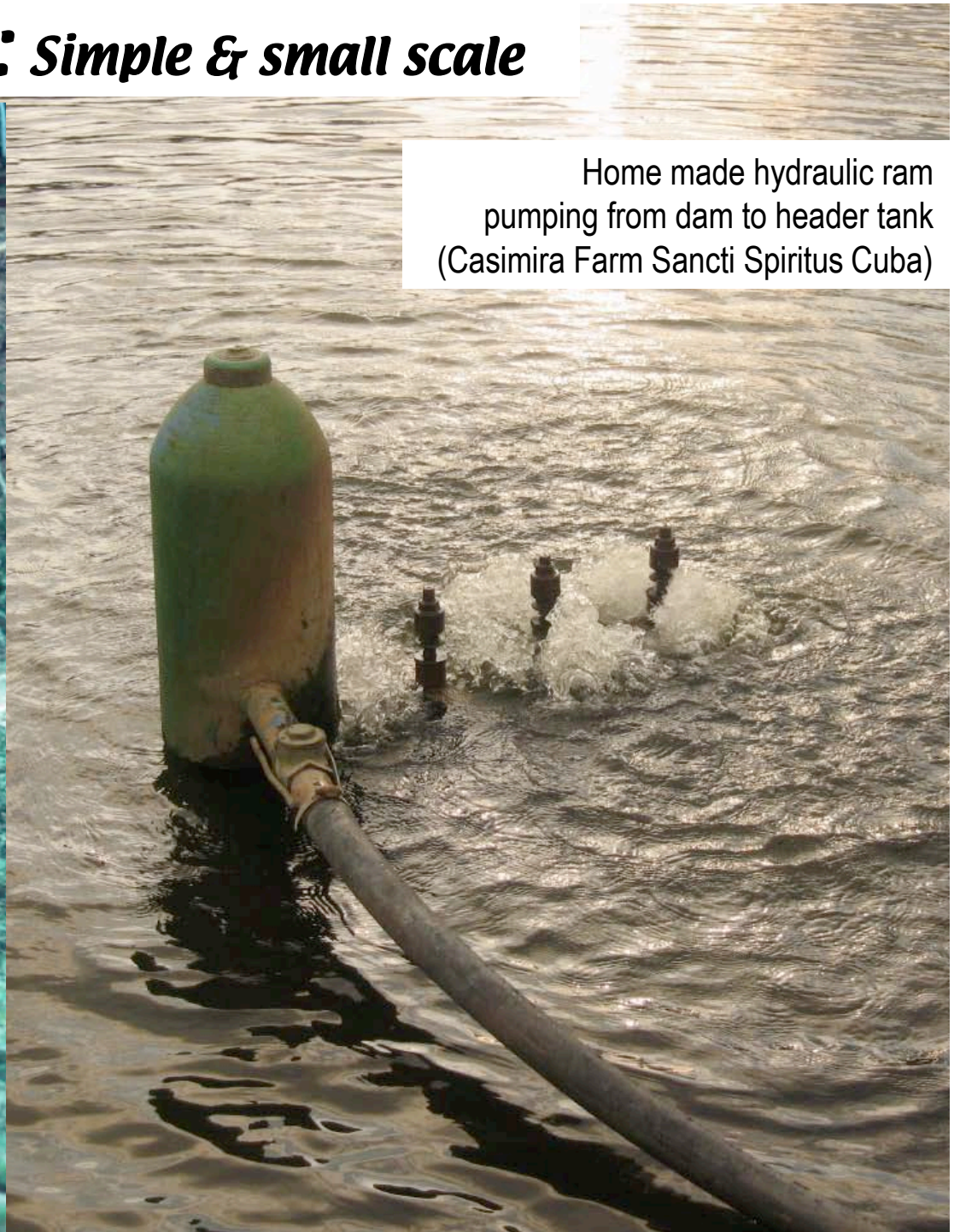


New fashion clothes made from recycled fabrics (Olympia, USA)

Appropriate Technology: Simple & small scale



Chainsaw mill cutting garden trees (Hepburn 1993)



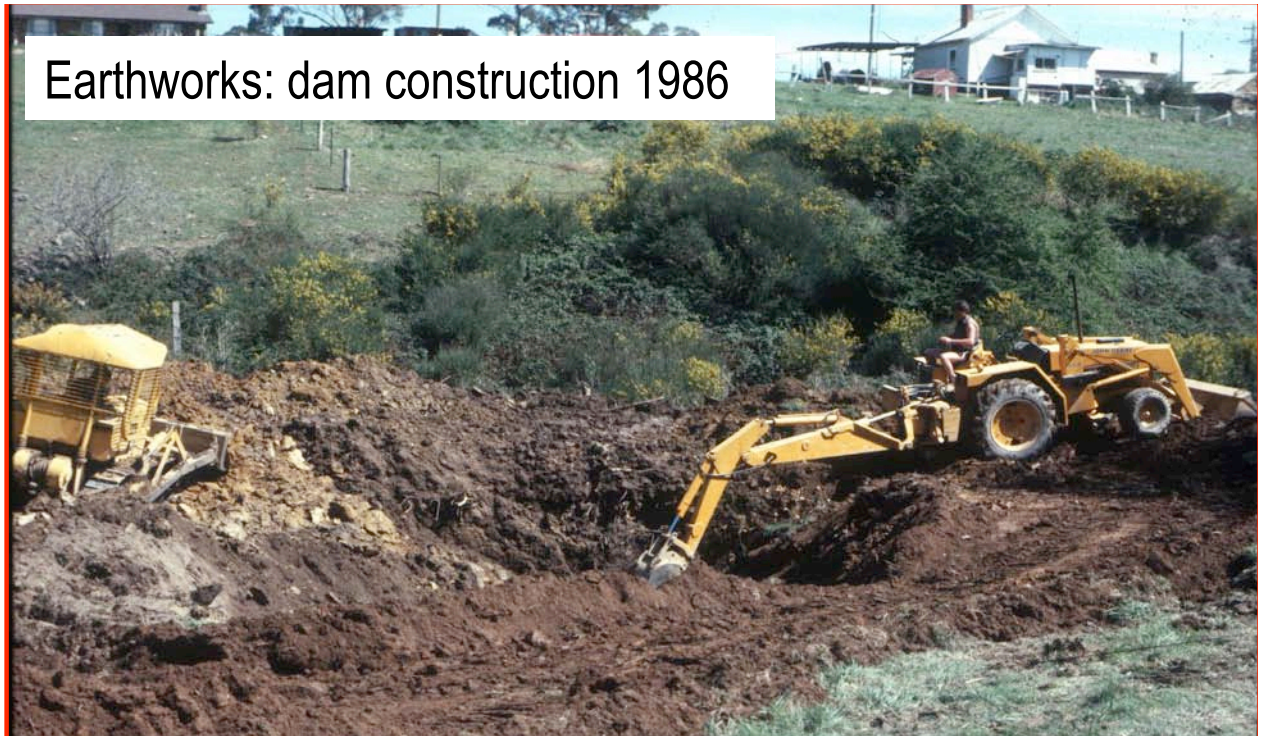
Home made hydraulic ram
pumping from dam to header tank
(Casimira Farm Sancti Spiritus Cuba)

Creative use of fossil fuels & technology

Photovoltaic Power; embodied fossil energy to provide for modest needs



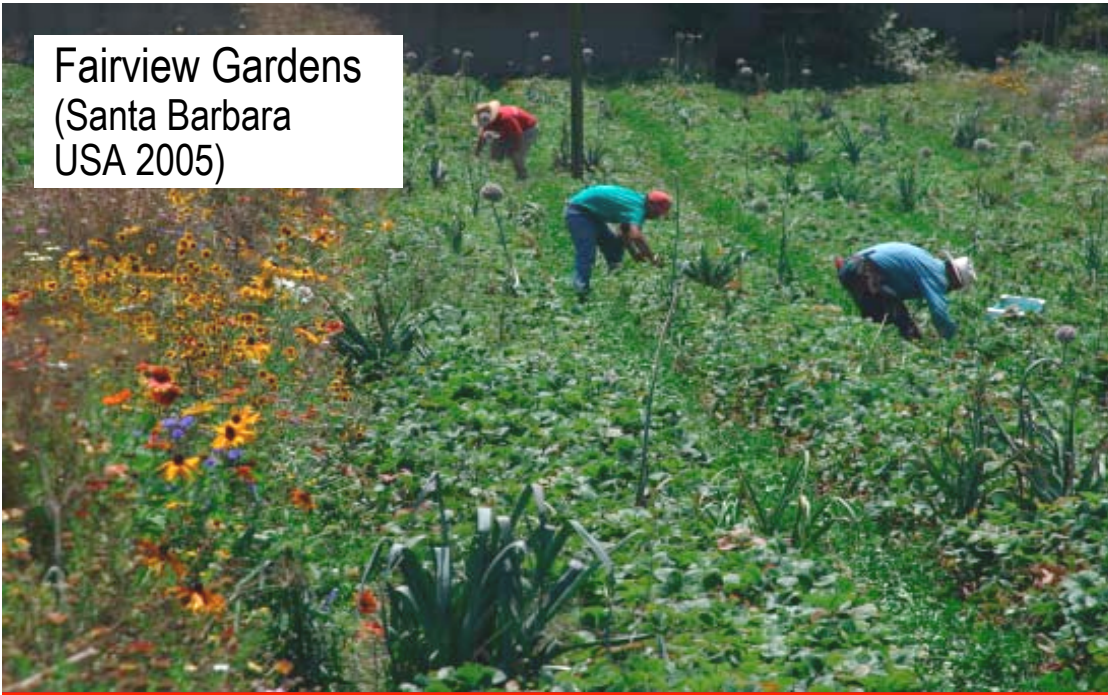
Earthworks: dam construction 1986



Melliodora aerial view 2003



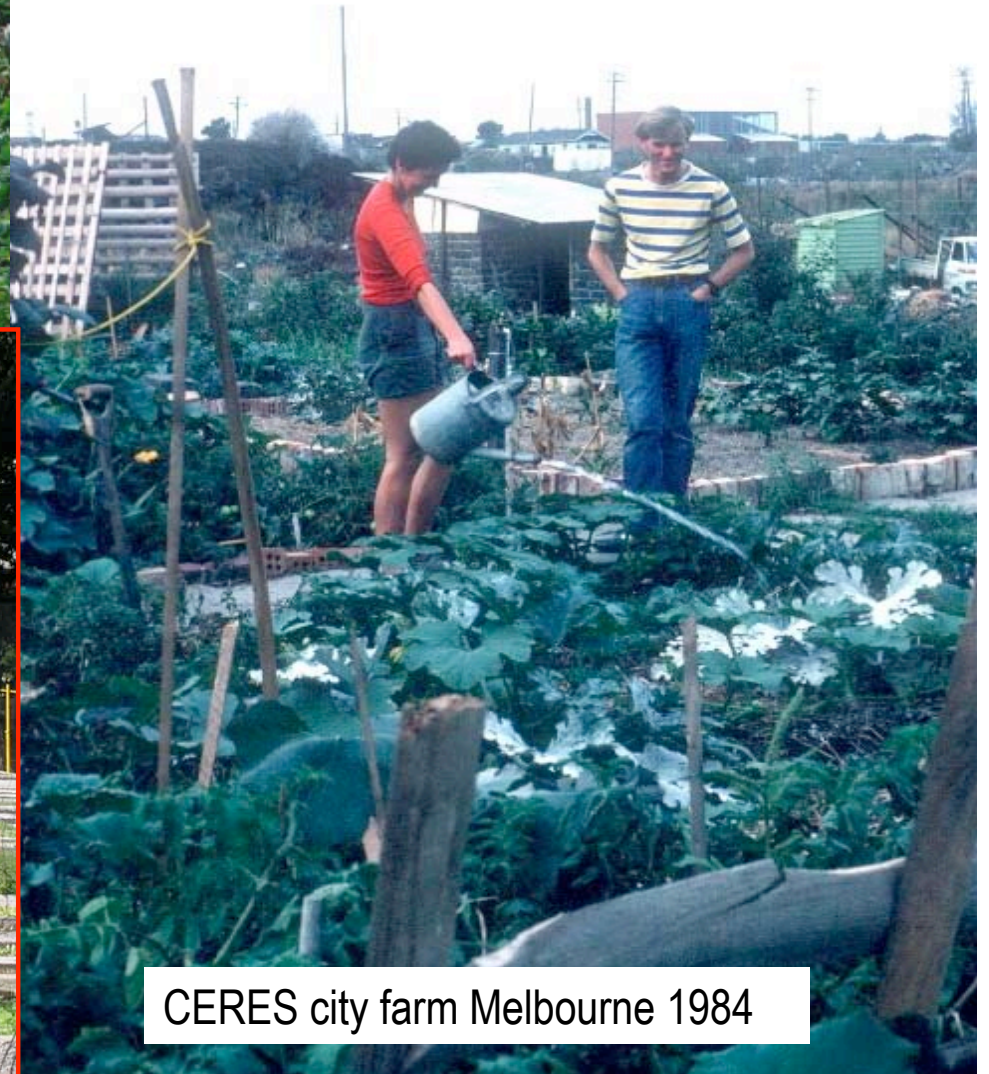
Fairview Gardens
(Santa Barbara
USA 2005)



Organoponico Habana
Cuba 2006 Photo Finn Mackesey



Urban Agriculture & Community Gardens



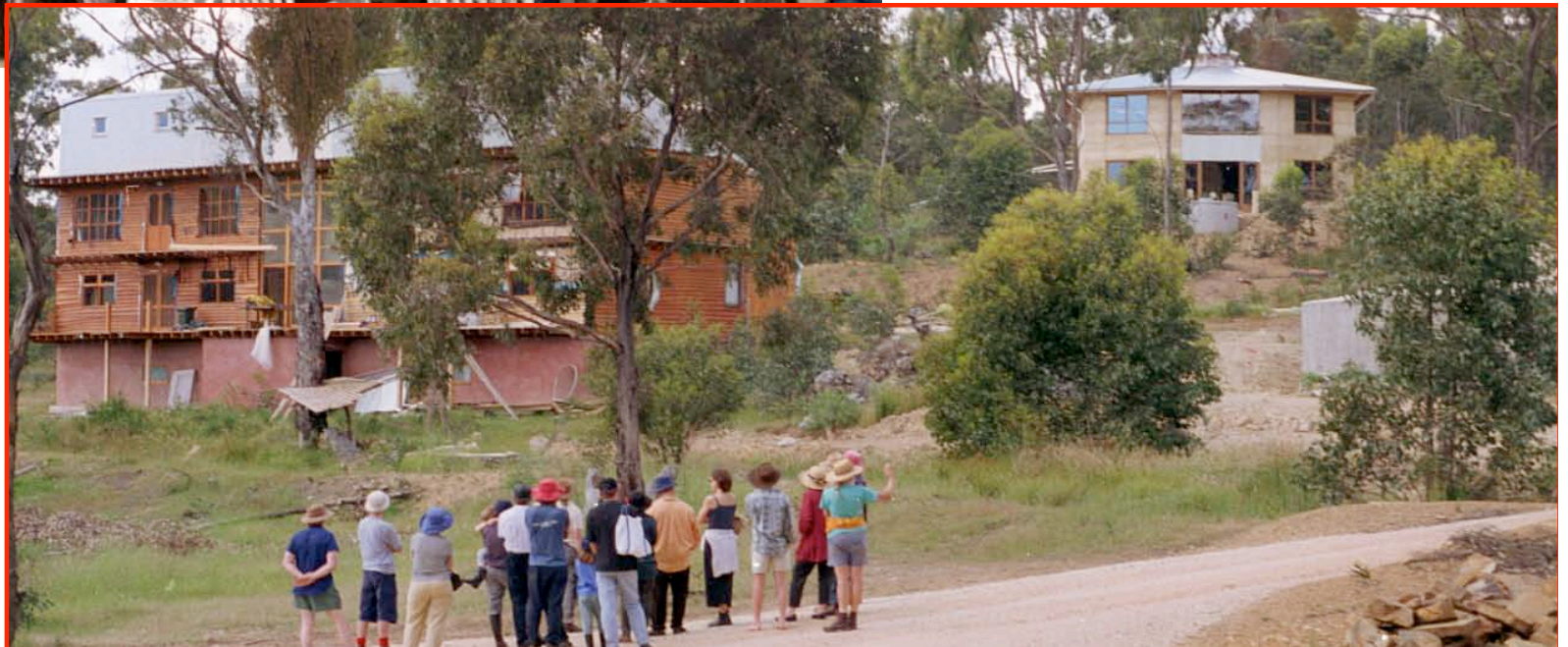
CERES city farm Melbourne 1984

New ways of sharing land

- ***Ecological building***
- ***Common infrastructure***
- ***Community governance***



Shared meal at the
community building
(Gaia Ecovillage, Argentina)

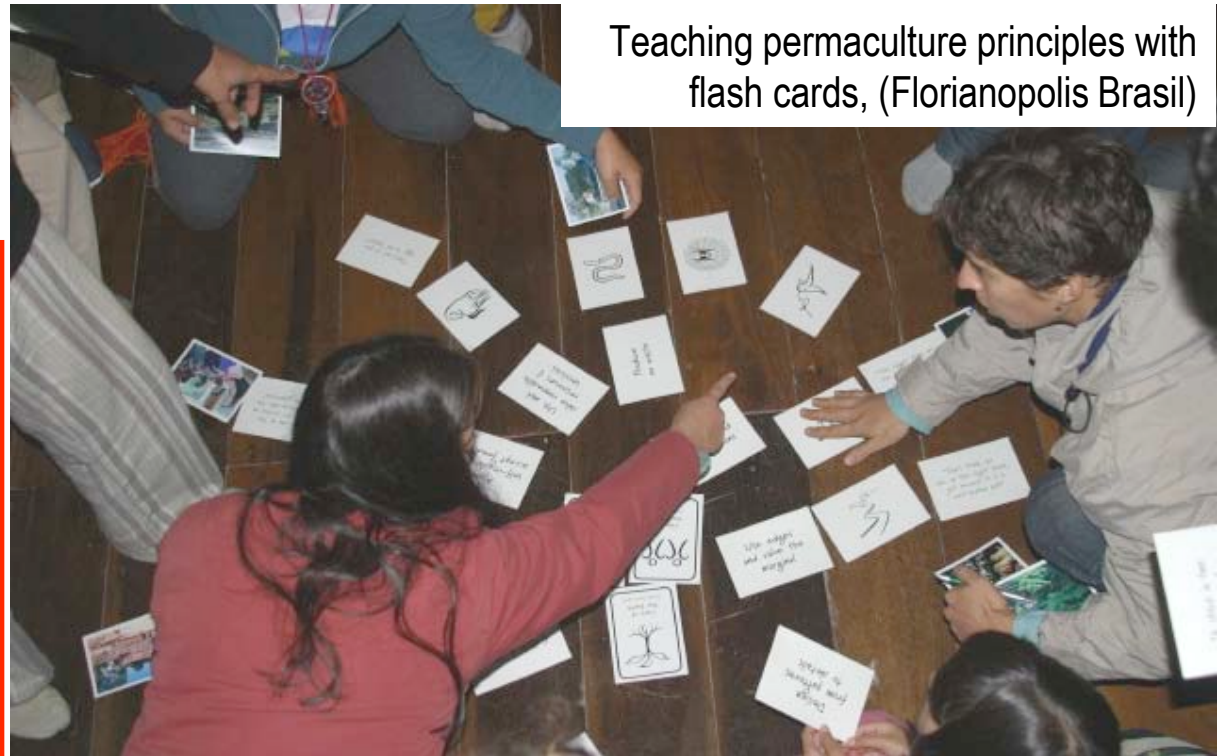


Fryers Forest
Eco-village
(Central Victoria, Australia)

Old & new ways of Learning & Culture



Self taught knowledge and skill
Joe Hollis N. Carolina: 30 years of medicinal botany



Teaching permaculture principles with flash cards, (Florianopolis Brasil)



Circle dancing on permaculture course, (Gudhorst, Germany)

New ways of Trading & Finance



Australian Ethical®
Investment + Superannuation

Community Supported Agriculture, Melliodora



LETS
local currency



**WWOOF
Australia**



**Willing Workers On
Organic Farms Australia**

Seven Domains of Permaculture Action

