Introduction to Permaculture

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Cultivated & Productive Ecologies

• Working with microclimate
• Forest gardens
• Intensive gardening
• Perennial vegetables
• Perennial grains
• Woody agriculture
• Coppice
Windbreaks


Sun traps

Bill Mollison – Introduction to Permaculture (1991)
Patios are warmer both by day and by night.

Frost pockets

**FIGURE 2.4** How cold air flows downslope. Note ways to avoid frost pockets by using vegetation to divert cold air.

Bill Mollison – Introduction to Permaculture (1991)
Forest gardens

Less energy to maintain
More resilient
High diversity
High interconnectedness
Low/zero maintenance
Low/negative greenhouse gas emissions

More energy to maintain
Less resilient
Low diversity
Low interconnectedness
High maintenance
Medium-to-high greenhouse gas emissions

Martin Crawford – Creating a Forest Garden (2010)
Figure 5.31. This polyculture of trees, shrubs, and herbs shows mixtures of root types in one small space. The species and scheme are adapted from figure 2.14’s microforest garden (page 44).
Martin Crawford – Forest Garden
Intensive gardening

• Raised beds
• Seed saving
• Diversity & polycultures
• Solar heated greenhouse
FIGURE 5.10 An idealised kitchen garden layout for temperate areas providing full nutrition, appropriate house climate, low maintenance compost area (near lemon tree), trellis crop, and herb spiral.

Bill Mollison – Introduction to Permaculture (1991)
Fig. 10. Mellankultur: tre växter. Skuggtåligh och snabbväxande pak choi mellan högväxande bönor. Ytterst mangold.

Lena Israelsson – Odla orientaliskt (1998)
Perennial vegetables

Sea Kale (Strandkål)

Asparagus (Sparris)
Perennial vegetables

Ramson (Ramslök)
Ostrich Fern (Strutbräken)
Perennial grains

Annual wheat (on left in each panel) and Perennial wheatgrass

http://en.wikipedia.org/wiki/Perennial_grain
Woody agriculture

http://www.badgersett.com/
Coppice

http://en.wikipedia.org/wiki/Coppicing
Efficient energy planning

- Sector analysis
- Zone planning
- Slope
Sector Analysis

- Sun sector
- Flows of sun, light, rain, water flow, wind, noise and potential fire as they enter and move through the site.

http://treeyopermacultureedu.wordpress.com/chapter-2-3-or-the-11-design-principles-from-the-intro-book/energy-efficient-planning/
Further Aspects of Analysis

• Legislation
• People and Community
• Physical resources
  – *Energy*
  – *Capital*
  – *Waste disposal and recycling*
  – *Economic resources*
• Economic Resources
• Vegetation and Wildlife
• Aesthetics
Zone planning

*Figure 1.2* The relationship between distance and intensity of use. Frequently-visited areas are placed closest to the house.

Bill Mollison – *Introduction to Permaculture* (1991)
Bill Mollison – Permaculture: A Designers Manual (Tagari 1988)
Slope

• Site in profile
• Downhill flow of resources/energy

Figure 5.6. Infiltration swales stop erosion and increase the infiltration of runoff water into the soil on sloping land. They always run along the contour so that water sits in the dug trench and soaks into the soil. The top of the berm and the intersection of the cut and fill must be dead level to prevent the swale from washing out, but the bottom of the swale can vary a little to make wetter and drier areas inside. Seed and mulch disturbed soil as soon as possible after construction. Plant trees downhill of the berm to make use of the infiltrated water.
Geoff Lawton – Swales
Food from Dryland Gardens - An Ecological, Nutritional, and Social Approach to Small-Scale Household Food Production (1991)
Water Harvesting Techniques

- Catch from buildings, structures, hard surfaces, land.
- Store on land: barrels, ponds, cisterns
- Store in plants & soil
- Store at highest potential spot
- Use at highest potential level
- "move as long as possible, be used as many times as possible, get in contact with as many elements as possible, over as long time as possible"
Pumps powered by the flow of water: Sling pump

http://www.omafra.gov.on.ca/english/engineer/facts/04-027.htm
Ram pump

- Storage tank
- Point of use
- Thin pipe from pump
- 10% water delivered
- Big pipe to pump
- Spring intake
- 90% water runs off (drive water expelled from check valve)
Grey Water Recycling
Resilience, large-scale land restoration techniques and designing for extremes

• Climate change
• Diversifying our options for food/water/heat/shelter
• Medicinal plants
• Transportation options
• Specialization within different areas
Geoff Lawton – Greening the Desert
Buildings, Structures and Energy

- Low & sustainable energy use
- Local adaptation
- Healthy & sustainable materials
- Cycling of nutrients
- Retrofitting
- Lifestyle change
Den selvforsynende landsbyen, Danmark
Den selvforsynende landsbyen, Denmark
Urban Environment Permaculture

• In an urban environment, what kind of resources are there available?
NYC
NYC High Line
Chicago
Depave - Portland
Andrew Faust – Occupy the Economy
Thank you!

Don’t forget your permaculture googles!