

Ecovillage at Ithaca: Laboratory for Sustainability?



Ecovillage at Ithaca Center for Sustainability Education

Sustainability Studies Series

Module #1, Part 1 of 2 Parts

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The EVI Mission: To promote experiential learning about ways of meeting human needs for shelter, food, energy, livelihood and social connectedness that are aligned with the long term health and viability of Earth and all its inhabitants.

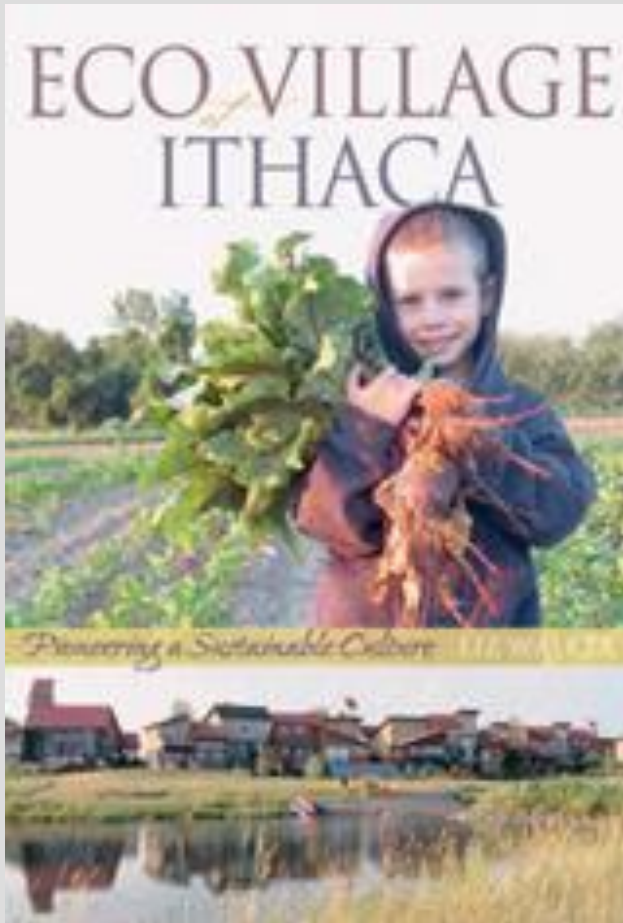
Adopted by the EVI Board
28 October 2009

Ecovillage Ithaca: Laboratory for Sustainability?

To view or download several short pdf documents that contain detailed information about our heating systems, legal structure, appearance in publications and dissertations, work committees and community structure, click [here](#).



Ecovillage Ithaca: Laboratory for Sustainability?



This slideshow is intended to supplement Liz Walker's 2005 book on Ecovillage at Ithaca...

To read a detailed description of the book, click [here](#).

To order online, click [here](#) and scroll to the bottom. \$17.95 new via Paypal.

Ecovillage Ithaca: Laboratory for Sustainability?

Topics of this Presentation

1. The Sustainability Concept
2. Current Challenges to Sustainability
3. Why an Ecovillage?
4. Introduction to EVI
5. Sustainability at EVI

Part 5.2 starts in slideshow [Part 02](#)

6. Appendix: Herman Daly's rules for sustainability – also in [Part 02](#)

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Sources

A complete list of the books and articles referred to in this presentation can be downloaded at:

<http://msuweb.montclair.edu/~franker/SustainabilityFiles/GreenprintReadings.pdf>

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1. The Sustainability Concept

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The most influential definition of sustainability derives from the Brundtland Report, named after its author Gro Harlem Brundtland, a Norwegian M. D. and former Labor Party prime minister. She was also Norway's Minister for Environmental Affairs from 1974 to 1979.



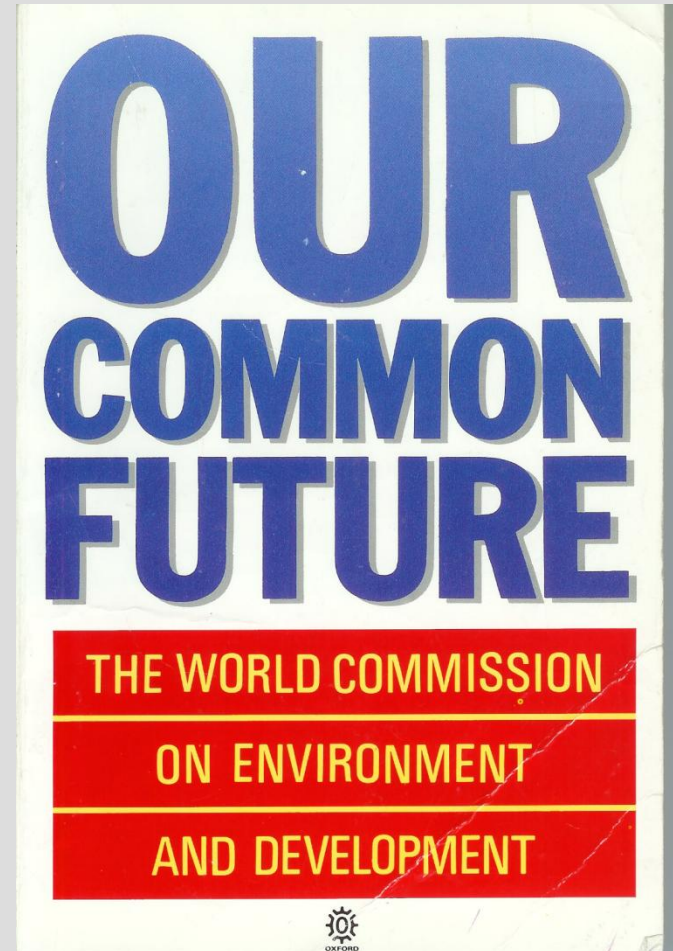
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“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Our Common Future (World Commission on Environment and Development 1987:43)

Complete text in English at:

<http://worldinbalance.net/intagreements/1987-brundtland.php>



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Note four features of the definition:

- Present generation should not have to sacrifice;
- Implies intergenerational solidarity –thinking about the possible needs of future generations;
- Implies acquiring knowledge of the resource base for meeting human needs and knowledge of its rate of decline;
- Implies conscious human effort and planning (or, just let the market do it?)

2. Challenges to Sustainability,

Or...

Why Do We Need a Sustainability Concept?

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- Widely recognized sustainability concept is recent (1987);
- Response to growing scientific awareness of and concern about threats to earth's life support system;
- Response to growing environmental movement internationally

What is the Millennium Ecosystem Assessment?



- Largest assessment ever undertaken of the health of ecosystems
 - *Prepared by 1360 experts from 95 countries; extensive peer review – results published in 2005*
 - *Consensus of the world's scientists*
- Designed to meet needs of decision-makers among government, business, civil society

<http://www.MAweb.org>

The Balance Sheet

Enhanced	Degraded	Mixed
Crops	Capture fisheries	Timber
Livestock	Wild foods	Fiber
Aquaculture	Wood fuel	Water regulation
Carbon sequestration	Genetic resources	Disease regulation
	Biochemicals	Recreation & ecotourism
	Fresh Water	
	Air quality regulation	
	Regional & local climate regulation	
	Erosion regulation	
	Water purification	
	Pest regulation	
	Pollination	
	Natural Hazard regulation	
	Spiritual & religious	
	Aesthetic values	

Bottom Line: 60% of Ecosystem Services are Degraded – threat of “nonlinear events”

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MA Synthesis SDM (p. 6): “Approximately 60% (15 out of 24) of the ecosystem services evaluated in this assessment (including 70% of regulating and cultural services) are being degraded or used unsustainably. Ecosystem services that have been degraded over the past 50 years include capture fisheries, water supply, waste treatment and detoxification, water purification, natural hazard protection, regulation of air quality, regulation of regional and local climate, regulation of erosion, spiritual fulfillment, and aesthetic enjoyment. The use of two ecosystem services—capture fisheries and fresh water—is now well beyond levels that can be sustained even at current demands, much less future ones. At least one quarter of important commercial fish stocks are overharvested (*high certainty*). (See Figures 5, 6, and 7.) From 5% to possibly 25% of global freshwater use exceeds long-term accessible supplies and is now met either through engineered water transfers or overdraft of groundwater supplies (*low to medium certainty*). Some 15–35% of irrigation withdrawals exceed supply rates and are therefore unsustainable (*low to medium certainty*).....continues on next slide....

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...Some 15–35% of irrigation withdrawals exceed supply rates and are therefore unsustainable (*low to medium certainty*). While 15 services have been degraded, only 4 have been enhanced in the past 50 years, three of which involve food production: crops, livestock, and aquaculture. Terrestrial ecosystems were on average a net source of CO₂ emissions during the nineteenth and early twentieth centuries, but became a net sink around the middle of the last century, and thus in the last 50 years the role of ecosystems in regulating global climate through carbon sequestration has also been enhanced.”

Increased likelihood of abrupt changes

(established but incomplete evidence)

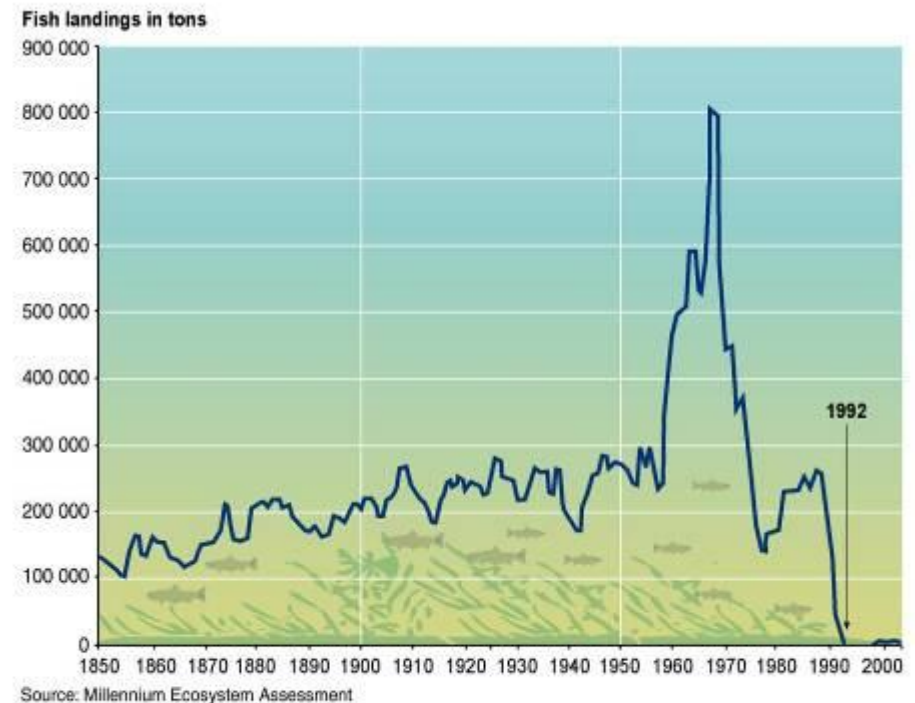
Most dramatic recent nonlinear event is in overfishing:

Fisheries collapse – seen by scientists as example of “abrupt” or “non-linear” change

Also called “ecological surprises”

40,000 jobs lost

No recovery yet despite total ban for 15 years



Atlantic Cod off Newfoundland

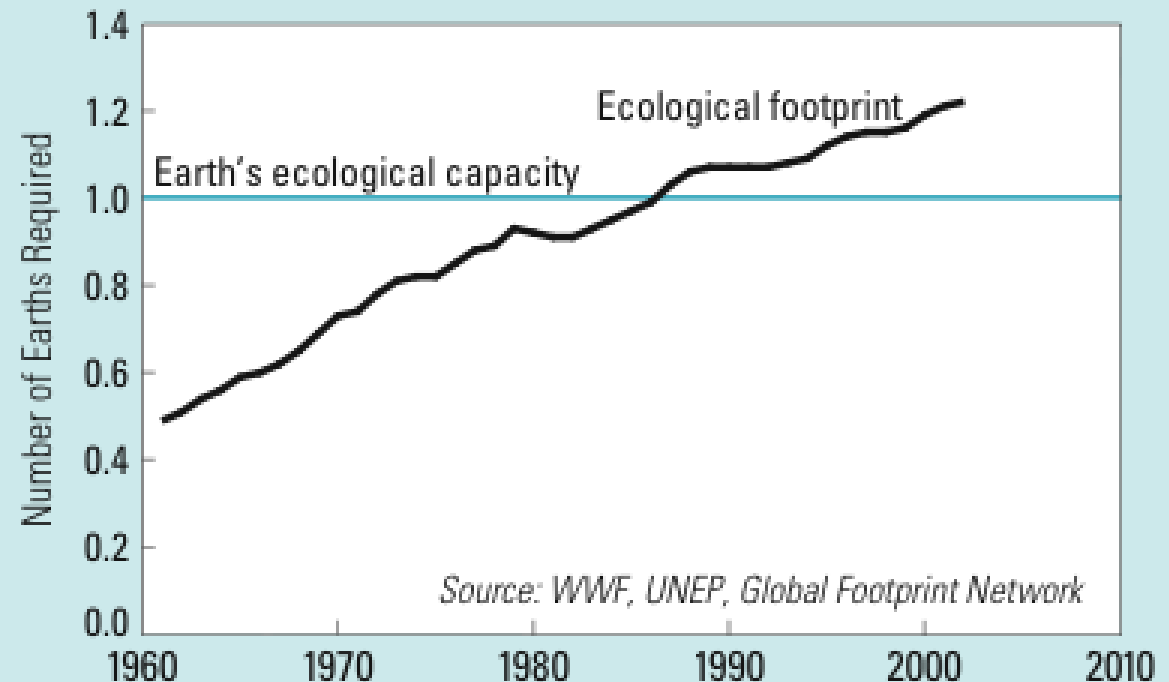
MA Synthesis pp. 11-12 *Fisheries collapse.* For example, the Atlantic cod stocks off the east coast of Newfoundland collapsed in 1992, forcing the closure of the fishery after hundreds of years of exploitation. (See Figure 11.) Most important, depleted stocks may take years to recover, or not recover at all, even if harvesting is significantly reduced or eliminated entirely.

Sustainability Indicators: The Ecological Footprint

“Overshoot”
begins just
before 1990 and
continues
upward even
after hitting 1.0,
the theoretical
maximum...

Source: Wackernagel, Mathis, *et al.* 2002. Tracking the ecological overshoot of the human economy. *Proceedings of the National Academy of Sciences* 99(14):9266–71.

Figure 1. World Ecological Footprint, 1961–2002



3. Why an Ecovillage?

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Concept of an ecovillage is to be a laboratory of “cost-effective measures to prevent environmental degradation.”

In other words, a laboratory for sustainability.

Ecovillages are “intentional communities.”

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“Official” definition:

“Ecovillages are urban or rural communities of people, who strive to integrate a supportive social environment with a low-impact way of life. To achieve this, they integrate various aspects of ecological design, permaculture, ecological building, green production, alternative energy, community building practices, and much more.”

Source: Global Ecovillage Network

<http://gen.ecovillage.org/>

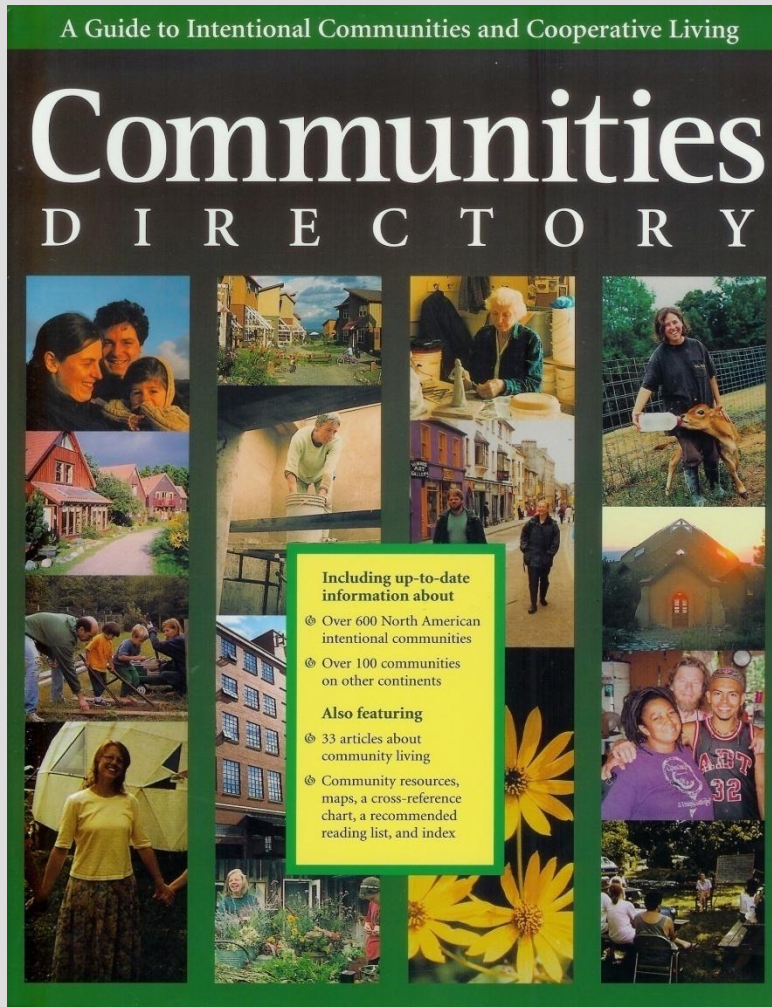
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Ecovillage at Ithaca mission statement:

To promote experiential learning about ways of meeting human needs for shelter, food, energy, livelihood and social connectedness that are aligned with the long term health and viability of Earth and all its inhabitants.

Adopted by the EVI Board 28 October 2009

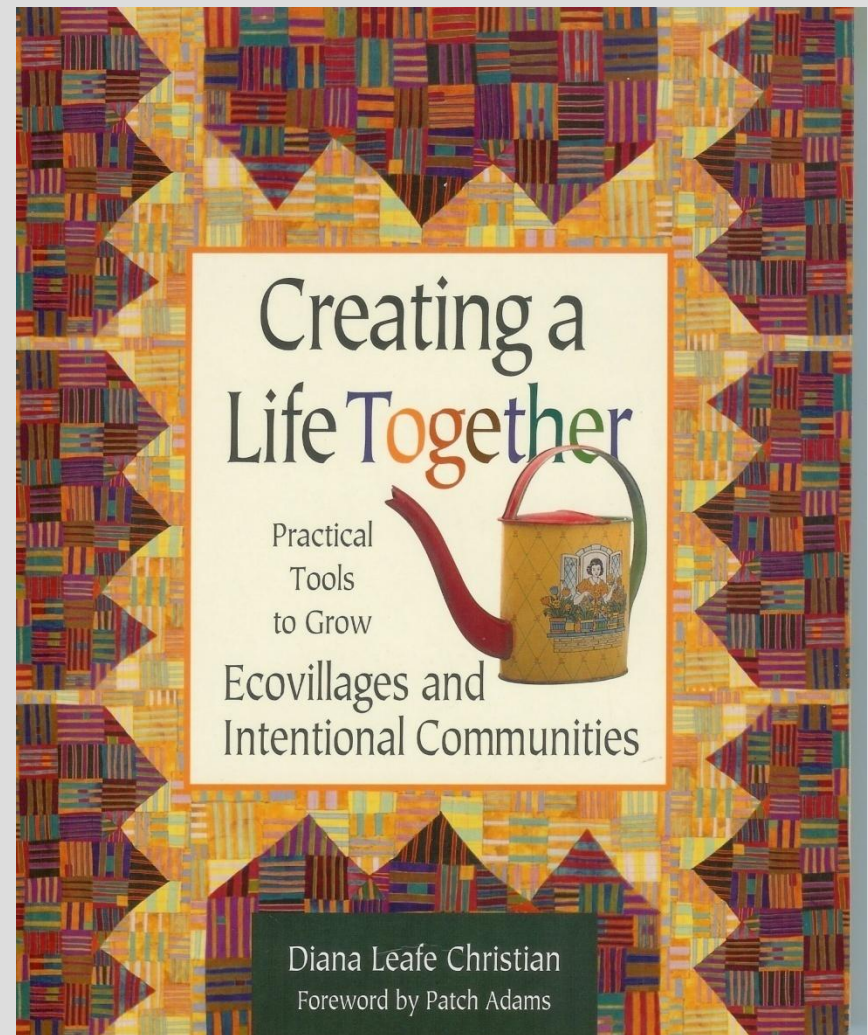
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The *Communities Directory* lists over 600 intentional communities in North America – most are ecovillages and many others are moving towards ecovillage living.

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Ecovillages are becoming so popular that Earthaven, North Carolina ecovillage resident Diana Christian has written a manual on how to set them up.



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At the Occidental Art and Ecology Center (ecovillage) in Sonoma California (65 miles north of SF), David Henson talks about the basic ecovillage rules for construction materials:

- Lowest possible embodied energy
- Lowest possible toxicity
- Greatest possible social justice

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At Earthaven
ecovillage 45
minutes Southeast of
Asheville NC...



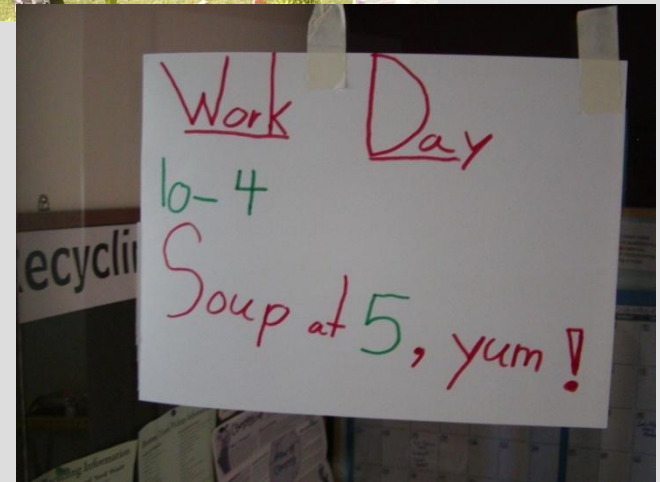
...more of a youthful countercultural
style obtains

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In Boston's
Jamaica Plain
neighborhood...



an ecovillage incorporates
Massachusetts mandated
affordable housing
and working class families

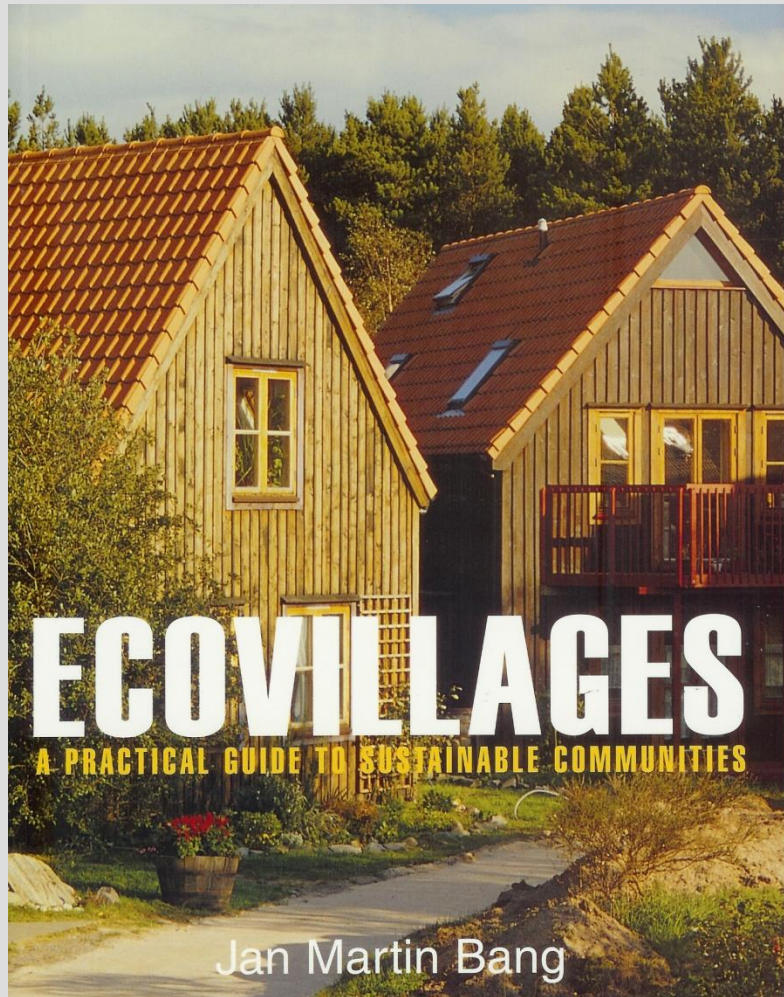


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While on Isle Lamotte in Northern Vermont, former TV actor and current Canadian Green Party VP Claude Genest...runs a one-man permaculture institute (more about permaculture later)



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Internationally, ecovillages cover a wide range from Tibetan self-sufficient communities to the more radical remaining Israeli kibbutzim to Danish “aging-in-place” units to the Camphill Movement to certain Native American communities to hippie communes left over from the 1960s.

They are all interesting anthropologically...but...

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...the ecovillage 2 miles west of Ithaca, New York has a special quality that makes it of interest...



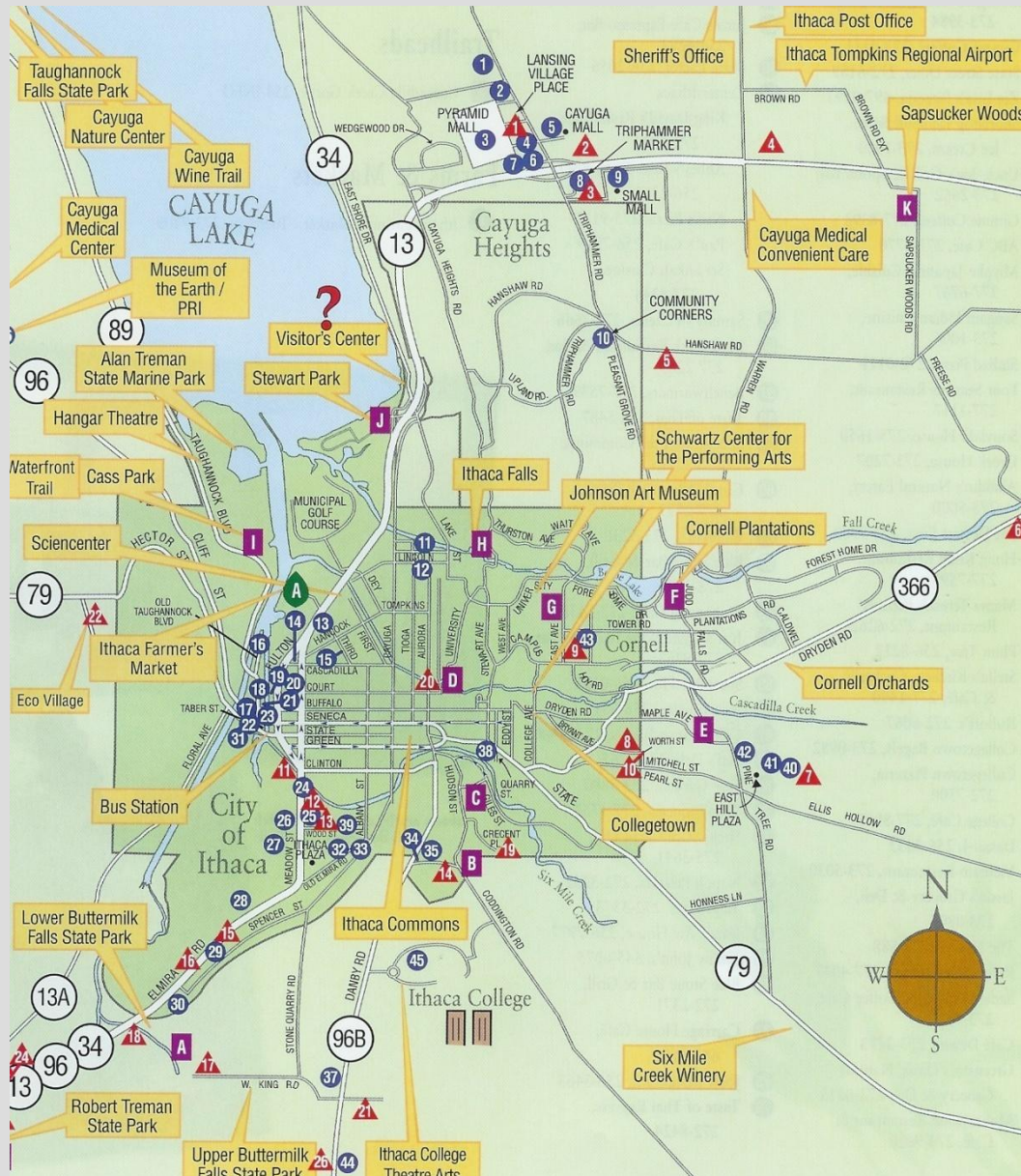
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...it was set up
explicitly to discover
how much residents
can lower the
community ecological
footprint...

...while...

...maintaining a middle
class US lifestyle

Can you find the eco-
village on the map?



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In other words, to meet the Brundtland Commission's definition of sustainable development...including

“...meets the needs of the present”

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Why do you think the connection to a middle class US lifestyle is so crucial?

4. Introduction to Ecovillage at Ithaca

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Ecovillage Ithaca is a community of

- 100 adults
- 62 children
- In 60 houses
- On 175 acres
- Old farm
- 2 miles west of Ithaca, New York



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You get the “eco” part right at the entrance off NY State Route 79

- ← Note the living roof on the bus shelter – most of the plants are scallions. Two Ithaca women run a business of supplying seedlings for living roofs in the area.

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Many eco-activities are documented, but several are still only vaguely measured.

Bus Shelter notes:

- Timber framed (local hemlock)
- 1 sod roof, 2 metal roofs
- 25+92+70 sq ft areas (207 total)
- Metal + hemlock recycled siding
- Passive solar heat- main area insulated
- Recycled windows
- 8x11ft main area seats 6-10
- Gravel/brick floor (thermal mass)
- Trellis overhang for summer shade
- Open bike storage (with security rack)
- PV system for lighting
- Intelligent lighting controls/bus signal
- Plantings block winter wind/provide Shade
- \$5,000 for materials- more from TCAT
- student/ volunteer labor

Who Was Rachel Carson?
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...you will find
yourself on our
only street –

Rachel Carson
Way

Can you guess
why our street
has this name?



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The street between the houses is for pedestrians only.

Ownership is like a condo: you privately own the inside of your house and one share of the nonprofit cooperative that owns the land. The coop is responsible for outside maintenance.



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The 175 acres were purchased for \$800,000 in 1991. The loan of \$380,000 was paid off in 2003.

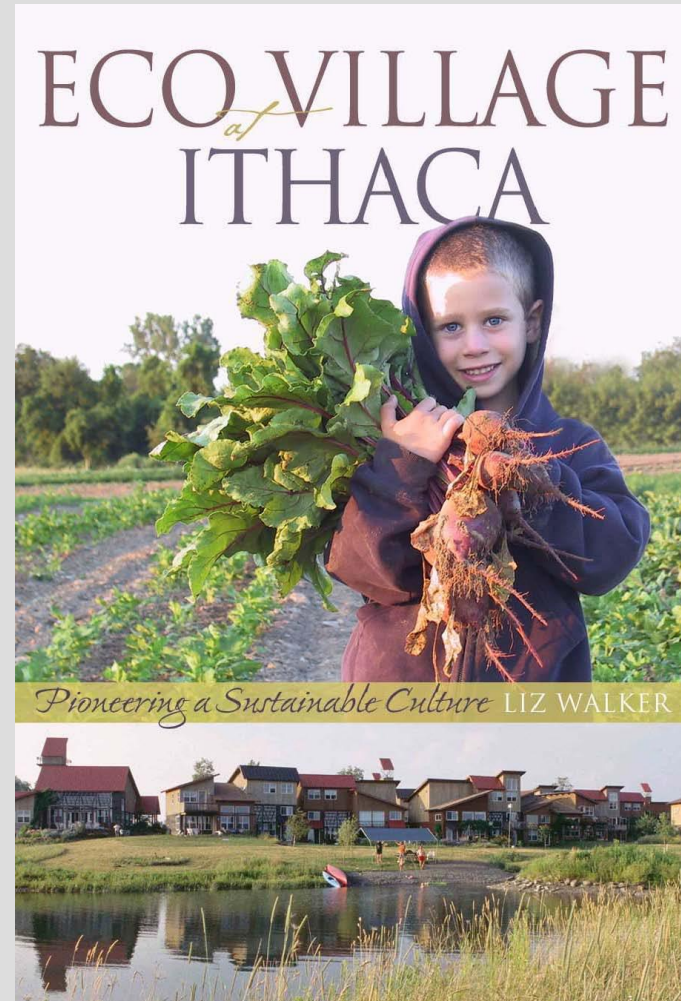


Residents
pay a
monthly
maintenan
ce and tax
fee just
like in
other
condos.

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You can read about EVI in founder-director Liz Walker's beautifully written first-hand account.

This slide presentation is based partly on her book and on five visits to EVI since 2001, and residence there since July 2009.



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EVI has a detailed
website at:



<http://ecovillageithaca.org>

5. Sustainability at EVI

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5. Sustainability at EVI

5.1 Building design and construction

5.2 Overall site design

5.3 The organic farm(s)

5.4 The Permaculture Institute

5.5 Social practices and pressures

Important to see all the features in combination as each one by itself is not unique to EVI.

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5.1 Building Design and Construction

Designing and Building Green Homes at EVI

- Use green building materials
- Heat air-space efficiently
 - Super insulation
 - Passive solar design
 - Duplexes share exterior wall
 - District heating
- Minimize power consumption
- Conserve water

EcoVillage homes use 40-50% less gas & electric
than other homes in Northeast

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We achieve our 40% less energy use in heating by:

- Smaller house size
- Superinsulation
- Duplex design with one shared wall
- South facing solar gain windows
- District heating system using hot water and heat exchangers

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All 30 homes in FROG – the first neighborhood – have “great room” designs with 14 foot solar gain windows. The big windows all face south.

Walls are double thick and filled with insulation made from old newspapers.



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Outside are trellises that let in sunlight during the winter but are covered in vines to cool the front during the warmer summer months. Inside blinds are also used.

Photo taken in May, 2008.

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Most houses are 1,400 square feet or smaller (avg is 1,228), compared with the avg US house of

- 2,175 sq ft built in 1993, about the same year as FROG (77% larger)
- Between 1950 and 2005 the avg US house increased by 1,247 sq ft even as family size declined by an avg of one person
- The median square footage for all US single structure units built in all years up to 2007 was 1,758 sq ft; 43% larger than EVI FROG homes.

Sources: 2,175 sq ft from Meltzer, Graham. 2005. *Sustainable Community: Learning from the cohousing model*. Victoria, B.C.: Trafford, page 121 citing American Housing Association data; 1,247 sq ft figure from *Mother Jones*, March-April 2005, citing data from National Association of Home Builders; 1,758 sq ft figure from *Statistical Abstract of the United State: 2007*. Washington, US Dept. of Commerce, Census Bureau, Table 954, page 610.

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In addition, U.S. homes and neighborhoods are taking up more land area per person – between 1970 and 1990, the population in the Los Angeles metropolitan area grew by 45% but the land area where people were living grew by 300% – six times as much.

Source: Diamond, H. and P. Noonan, editors. 1996. *Land Use in America*. Washington DC: Island Press. P. 4.

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What do people outside Ecovillage
get for all this extra space to use?

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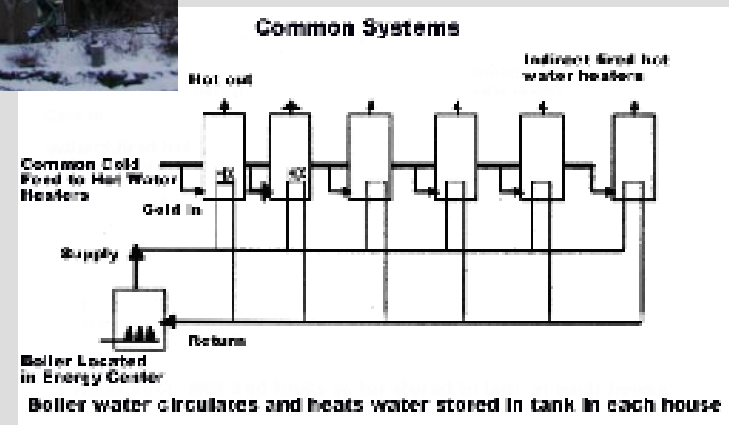
A more recent study found that people living in areas of sprawl drive greater distances, breathe more polluted air, face a greater risk of traffic fatalities and walk and use transit less frequently.

Source: Chen, D., R. Ewing and R. Pendall. 2002. *Measuring Sprawl and Its Impact: the Character and Consequences of Metropolitan Expansion*. Washington DC: Smart Growth America.

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In the first neighborhood (Frog) each 6-8 houses make up a heating “district,” served by an energy center attached to one of the homes. Inside are natural gas boilers with pipes running to each house in the district. The hot water heats the water and air in the houses through “heat exchangers.” To read about district heating with examples from around the world, click on the link below:

http://en.wikipedia.org/wiki/District_heating



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In Song, the second neighborhood, each two houses share a single furnace.

In Song, radiant floor heating was added – also supplied through hot water pipes.

The Frog common house also has radiant floor heating

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In Tree, the 3rd neighborhood now being designed – discussions are underway for a possible cogeneration heating system that could eventually be expanded to cover the entire village.

Cogeneration, district heating and radiant floor heating are among the most efficient and effective systems known at this time.

<http://en.wikipedia.org/wiki/Cogeneration>

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Much of the construction in SoNG, the second neighborhood of 30 houses, was often done by residents, using Structural Insulated Panels (SIPs) that provide super insulation and are easy to install.



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Some SoNG houses used experimental materials such as straw bale for wall insulation – now a growing method of environmental house construction nationally.

And 47% of SoNG houses have their own electrical supply on the roof.

But some SoNG homes run up to 2,200 sq ft

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One Cornell engineering prof who lives in SoNG is experimenting with solar heating and solar electricity – something the residents of FROG could not afford at the time of building in the early 1990s.



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End of Slide Show Part I

To see the next 65 slides go to
slideshow [Part 2](#)