Community design

A GREAT BUILDING DESERVES A GREAT COMMUNITY

Most delightful sustainable buildings are handicapped by the flawed design of the community where they are built. Sustainable neighborhoods and sustainable communities are in some ways easier to design than a single building. Working with a good community plan can improve the quality of life, add comfort and joy, improve health, and increase resource capture. The goal is not to settle for low-impact development but to strive for positive impact development.

The old hill towns of Europe and new approaches to community in Chapter 6 suggest methods for creating more sustainable neighborhoods and communities. Close the cycles.

Sustainable community design (from Ch. 6)

The class can be structured like a consulting firm with different teams developing the microclimate and bio resources profile, sustainable area budget, appropriate area (density, population), site location, appropriate building materials, passive design principles, transportation strategies, and resource harvesting/recycling / production. Food production, water, energy, etc.

San Gimignano a classic hill town

Larger teams can work well for this assignment but include an inter-team self-grading report to avoid slackers.

The community site is provided or selected by students. International are possible but it is a good idea to check availability of solar and microclimate data to avoid student frustration.

41° 02' 40" N 109°59' 28"W Design a New Town
The theme of the town would be ecotourism related to the fur trade, mountain men 1800-1840 and cowboy, ranch period 1880-1940

Students may be tasked to prepare a report that includes:

The community goals
Outline of programming decisions (number of residents, use pattern, etc.)

Sustainable area budgets
Solar and microclimate resource profile – solar radiation, temperature, humidity, wind, etc.

Circulation diagrams and expectations (pedestrian, bike, car, truck, bus)
Plan and cross sections of typical unit – depicting passive system elements (see Ch2, 3).including orientation, windows, insulation and mass for thermal calculations
Ventilation issues - street and landscaping design (see Ch3)
Choice of and calculations of winter and summer design days (see pages ... in this guide)
Material options or selections

Completion of this type of project can allay student's fear of large projects and help encourage integrated design at the large scales where it is often easier and more economical.

Community evaluation and retrofit

Students can also be assigned the evaluation of a community applying the design principles in the book. Determine a sustainable area budget for the community. How far away from this ideal is the existing community? Why? What works? What doesn't? What could be done about it? Easiest for a small town or neighborhood. Ideal for a disadvantaged neighborhood. Can also work well for a campus. Use Google street view for on-line field trips.

Swansea, SC was once a vibrant community: help revitalize it

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Landscape design

SOLAR ACCESS AND NATURAL COOLING

Sun when you want it –shade when you don't

Plants are excellent for solar control and natural cooling (Chapter 3). But experience working with specific elements of landscape is important. Many types of labs can be imagined. Three that are worth considering include: a landscape retrofit for cooling, a tension arbor, and a solar access/sun control evaluation of a neighborhood.

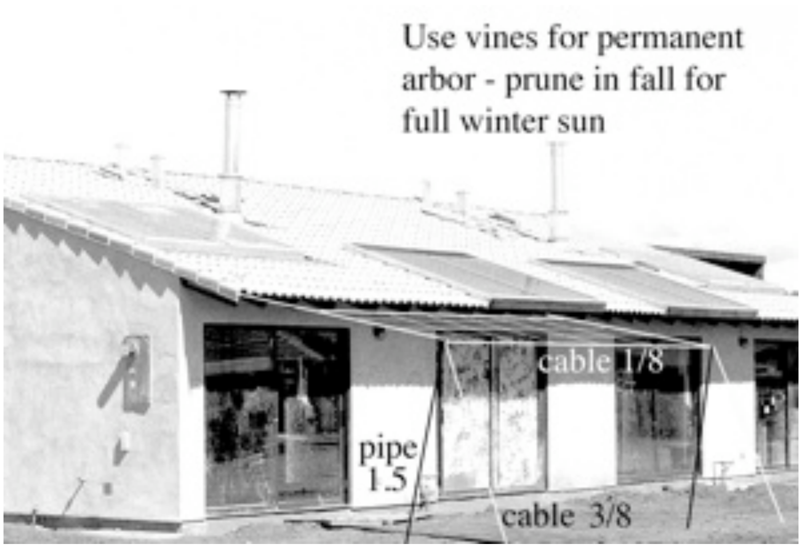
1. Landscape retrofit for cooling

The design challenge for this period is to develop landscape retrofit for cooling (or in a cold climate winter wind and blowing snow control). Teams of 3 or 4 work well for this assignment but include an inter-team self-grading report to avoid slackers. The buildings can be assigned or students can select their own projects from the area.

Students may be tasked to prepare a report that includes:
Solar and microclimate resource profile – solar radiation, temperature, humidity, wind, etc.
Building characteristics (size, orientation, overheating or glare problems)
Plan and cross sections – with retrofit landscape elements such as arbors, green walls, trees, etc.
Plant material options or selections (allergy free choices)
Rainwater harvesting opportunities

2. Tension arbor for solar control

The design challenge for this period is to develop a tension arbor design for cooling. Teams of 3 or 4 work well for this assignment but include an inter-team self-grading report to avoid slackers. The projects can be assigned or students can select their own projects from the area.



Students may be tasked to prepare a report that includes:

Solar and microclimate resource profile – solar radiation, temperature, humidity, wind, etc.
Plan and cross sections of tension arbor – with retrofit landscape elements such as arbors, green walls, trees, etc.

Choice of plant material options or selections (allergy free choices) for annual (hops, pea and bean vines) or perennial plants (grapes, wisteria, native vines).

Optional: irrigation system
Optional: misting system for added cooling

In addition students will work with tension arbor materials in a field lab.

Lab
Supplies and Equipment – aircraft cable of different types (galvanized, stainless steel), cable cutter, cable clamps, thimbles, swages (sleeves), swager, screw anchors, pipe columns or.... (see for example www.TEKsupply.com).

Students practice cutting, assembling and swaging assemblies. Ideally for a real project--perhaps for the outdoor lab but have an engineer review anchor and tension plan for larger assemblies.

3. Neighborhood landscape design or retrofit

The design challenge for this period is to develop a landscape retrofit for cooling (or in a cold climate winter wind and blowing snow control), stormwater management and/or food for a neighborhood or street. Teams of 3 or 4 work well for this assignment but include an inter-team self-grading report to avoid slackers. The street or area can be assigned or students can select their own projects.

Guerilla Landscaping for shade, stormwater

Students may be tasked to prepare a report that includes:
Solar and microclimate resource profile – solar radiation, temperature, humidity, wind, etc.
Street or site characteristics (size, orientation, overheating or wind problems)
Plan and cross sections – with retrofit landscape elements such as street trees, arbors, green walls, trees, etc.
Plant material options or selections (allergy free choices)
Rainwater harvesting/stormwater management opportunities

Lab

Learn how to plant a tree
Site prep, planting, plant protection, irrigation and maintenance
Explore options for plant production (container size and type)

Refer to Guerrilla planting -
Los Angeles, www.laguerrillagardening.org
Tucson http://sustainablecities.asu.edu/docs/SCN/tree-shade-summit/track1/session3/ann-audrey.pdf
Streetscape improvement Portland / www.portlandonline.com/bes/index.cfm?c=44407

Stormwater capture, Green Streets retrofit
Portland, Oregon

Landscape - food

A good project for students would be to be given a neighborhood or site location and then tasked to develop a plan for gardens and edible landscaping. This could be done in the vicinity or far away using Google Earth plus climate, plant, food, and water harvesting research.

Village Homes - passive solar home, ICS water heater and garden.

Start with the readings in Chapter 5. Then determine the area of unused or misused land in the site, neighborhood or area. What does the microclimate suggest would be appropriate? Who owns the land? How would it be managed? Where will the water come from? Is the soil likely to be contaminated?

Forest gardens and permaculture

One of the biggest failures of the American agricultural research system, and by its domination, the world research system, has been a narrow focus on a very few crops and their commercial production in intensive monocultural systems with costly inputs of energy, fertilizer, biocides, and water. Very little research has been undertaken to evaluate the hundreds of other food crops once considered staples by the indigenous people of the U.S. (and the world) and on the design of complex, sustainable systems for food production.

The small family farm seeks moderate yield and minimum risk rather than maximum yield with high risk. A complex mix of drought adapted perennial and annual crops offers this mix. The goal of a sustainable farming or gardening project would include the use of a wide range of locally adapted species in an intercrop/multicrop system. Perennial crops would receive particular attention.

The kitchen gardens of many areas of the world suggest what can be done. These gardens, rarely operated as a primary occupation, provide a very high percentage of vitamins and minerals, and often a substantial portion of calories and cash income as well. Residential developments would establish farm areas for intensive production of basic commodities and biofuels. Landscaping for the neighborhood would be chosen for food, fodder, and biofuels, just as they currently are in the highly evolved garden/forest systems of the world.

4/20/2011 San Francisco— *Mayor Edwin M. Lee today signed into law an amendment to San Francisco's planning code that will explicitly allow for "urban agriculture" in all areas of the City and the sale of produce from urban gardens in all zones.*

"The Urban Agriculture Ordinance will allow for greater local food production within City limits," said Mayor Lee. "This legislation will not only help support our community through the increased production of fresh, locally grown produce, but will also revitalize vacant arable land and create green jobs."

"Urban agriculture provides significant health, environmental and economic benefits," said Board of Supervisors President David Chiu, who co-sponsored the Ordinance. "This bill puts San Francisco on the map as a national leader in urban agriculture, and is a tangible example of how government can create more sustainable communities."

Further reading:

Bainbridge, D. A. 2002. Self Reliant Agriculture for Dry Lands. Sierra Nature Prints. Twain Harte, CA.

Bainbridge, D. A. 2007. A Guide for Desert and Dryland Restoration: New Hope for Arid Lands. Island Press, Washington, DC.

Bainbridge, D.A., J. Corbett and J. Hofacre. 1978. Village Homes Solar House Designs. Rodale Press, Emmaus, PA.

Britz, R. 1981. The Edible City Resource Manual. William Kauffman, Inc, Los Altos, CA.

Brown, A. 2009. Just Enough: Lessons in living green from traditional Japan. Kodansha International, NY.

Brownrigg, L. 1985. Home Gardening in International Development: What the Literature Shows, League for International Food Education, Washington, D.C.

Cole, D. D. Lee-Smith and G. Nasinyama. 2008. Healthy City Harvests. International Potato Center, Makere University Press. www.cipotato.org/publications/pdf/004361.pdf

Fukuoka, M. 1978. The One Straw Revolution. Rodale Press, Emmaus, PA.

Gómez-Pompa, A. and D. A. Bainbridge. 1993. Mexico, pp. 483-548 in Sustainable Agriculture and the Environment in the Humid Tropics,, comp. National Research Council. Washington, DC, National Academy Press.

Gomez-Pompa, A., and D. A. Bainbridge. 1995. Tropical forestry as if people mattered. pp. 408–422 in A. E. Lugo and C. Lowe, editors.Tropical Forests: Management and Ecology. Springer-Verlag, New York.

Gonzalez-Jacome, A. 1985. Home gardens in Central Mexico. In: I.S. Farrington (ed) Prehistoric Intensive Agriculture in the Tropics. BAR, Oxford, pp. 521-537.
Howard, A. 1943. An Agricultural Testament. Oxford University Press, NY. (see esp. chapters 8 and 13).
Lyle, J.T. 1985. Design for Human Ecosystems. Van Nostrand Reinhold Co: New York, NY.
Mâté, F. 2009. The Wisdom of Tuscany. WW Norton, New York.
Mollison, B. 1988. Permaculture A Designer's Manual. Tagari Publications, Tyalgum, Australia.
Morris, D. and Friend, G. 1975. Energy, Agriculture and Neighborhood Food Systems. Institute for Self-reliance, Washington, DC.
Ninez, V.K. (ed.). 1985. Household Food Production: Comparative Perspectives. Lima: International Potato Center.
Mollison, B. and D. Holmgren. 1984. Permaculture One. Tagari Publications, Stanley, Australia.
Nordahl, D. 2009. Public Produce: The New Urban Agriculture. Island Press, Washington, DC.
Olkowski, H. and W. 1977. City People's Book of Raising Food. Rodale, Emmaus.
Palassio, C. and A. Wilcox, eds. 2005. The Edible City: Toronto's Food from Farm to Fork. Coach House Books.
Steel, C. 2009. Hungry City: How Food Shapes Our Lives. Random House, London.
Van der Ryn, S. and P. Calthorpe. 1986. Sustainable Communities. Sierra Club Press, San Francisco, CA.
van Dresser, P. 1976. A Landscape for Humans. Lightning Tree Press, Santa Fe, NM.

According to the IDRC in 1997 (Mougeot, 1997) there were about 200 million urban dwellers that were also urban farmers. They provide food and income to about 700 million people. In Dar es Salaam in 1980, 44% of low-income earners had farms, but by 1987 70% of heads of households engaged in some farming or husbandry. During the 1980s, 25% of all urban households engaged in food production in the US, compared to 57% in six Kenyan cities, with other city-specific figures ranging from 32.6 to 70% for Kisangani, Kampala, Lusaka, Moscow (1991) and Dar es Salaam. Cairo in the early 1980s had at least 80,000 households raising animals at home. The value of this was also highlighted by a paper by Marshall Sahlins on "sunlighting in Ghana" about government workers going home at noon to work on gardens.

Mougeot, L.J.A. 1997. Overview Urban Food Self-Reliance: Significance and Prospects. IDRC Reports v21, n.3.