Permaculture: a Prescription for a Sustainable Future

Permaculture is an ecological design strategy, which attempts to assemble the material and conceptual components of an ecosystem in such a way that all life benefits (i.e. human and non-human).

Permaculture derives its name from two words, "permanent" and "culture." Its roots evolve from the design of sustainable agricultural systems spanning to the techniques and principles of ecologically designed communities, urban restoration and self-reliant regions.

Permaculture has a set of ethics or guiding principles. The three primary ethics are:

- Care of land;
- Care of people;
- Reduce consumption and share surplus.

Permaculture can be applied at any scale, from an apartment balcony, suburban backyard, to a design of an entire community, city or watershed.

Permaculture as a design strategy, is rapidly gaining popularity. In 1996, The Institute for Bioregional Studies introduced the first Permaculture Design Course in Atlantic Canada.

Today, more than ever, Permaculture based communities offers a prescription for the future in which people could once again create self-reliant lives, by growing food and providing for shelter, energy and their livelihood, all within a supportive and interdependent community.

The design concepts of permaculture have a lot to offer. Below are basic permaculture design principles and how each one might apply to agriculture.

Principle 1: Ethics, care of land and people
The introduction of a land care ethic would certainly be a step forward for the all to familiar centralized, and profit-driven conventional agriculture. With a land care ethic, biocides which poison the soil and wildlife would not be used and cultural practices such as no-till would be promoted.

Principle 2: Relative location
This principle involves the strategic selection and placement of plants, animals, structures, etc., so that the yields of one element become the raw materials or requirements for another element all the while relating the design to the patterns of the particular landscape. The classic example for this principle is the chicken. What does the chicken produce that can be used by other elements in the design? Are these elements in the correct location to benefit from the interaction? For example, chickens produce fertilizer (manure), CO2, and heat, all of which can be used in a

greenhouse. Is the greenhouse near the chicken coop? This same type of analysis can be conducted for all elements in a design.

Principle 3: Multiple functions, single element
As a rule of thumb, every element should provide at least three functions. Again the chicken example. Instead of simply having chickens for income (one function), they might also serve other needs such as fertilization and weed control. Another example is an element as simple as a fence. If a fence is needed to contain animals, for example, design the fence in such a way that it provides many functions. A "living" fence can act as a holding area for animals, provide animals with food and fodder, act as a windbreak, and provide food and medicine for the family. One final example is a living resource such as bees. When designed into a system they serve several functions; food, income, and pollination.

Principle 4: Multiple elements, single function
Multiple elements for a single function adds diversity and makes the local farm ecosystem more resilient to local environmental fluctuations. For instance, if the single function is soil fertilization, instead of simply relying on chemical fertilizer, introducing multiple elements would include crop rotations, use of legumes, animal manures, etc. As another example, take the function of heating a structure such as a greenhouse. Multiple elements would include body heat from animals, heat from compost piles placed against the structure, and the use of thermal mass to store the collected heat.

Principle 5: Efficient energy planning
The goal of this design principle is to help reduce the amount of effort (primarily human labour) required to manage a farm. The property is divided into zones related to how frequently each zone is visited. The more intensive the activity the closer to human habitation it should be. For instance, gardens and high maintenance animals should be closest to the house.

Principle 6: Biological resources
In this case, the goal would be to move away from monocultures. In permaculture designed agricultural systems, animals would be re-introduced into the farm. Ponds and wetlands might also be created. The idea of this principle is to attempt to mimic the diversity of natural systems and, hopefully, the resilient and resistant qualities of those natural systems. The design would also focus on utilizing energy flows (water, wind, etc.) that pass through a farm. It is also important not to forget the most often neglected biological resource - people!

Principle 7: Energy recycling
When redesigning a farm it is necessary that energy flowing through the system is used in many different ways. In the case of water, water harvesting systems might be created (keyline systems, dams, swales, etc) to intercept water as it passes through the landscape. Energy recycling would also include recovering biogas from manure and orientating structures to obtain maximum solar gain.

Principle 8: Maximize diversity
For permaculture systems, the idea is to build more stability into a farm by maximizing diversity,

both in terms of plant and animal species, but also in terms of income or livelihood. In terms of plants and animals, diversity refers not only to the total number of species, but more importantly to the number of beneficial interactions between those species. It is important to attempt to create as many niches, microsites, and habitats as possible by increasing edges, patterns, and creating plant guilds. In terms of diversifying income, this might include energy tree/perennial grass planting for biomass and liquid fuels, medicinal plants, etc.

Principle 9: Stacking
In permaculture design, stacking in time, space (using vertical space with trellis, structures, etc), and schedules (time x space) is often discussed. Stacking is important in terms of making human derived food production systems more compact so that larger areas of land can be put back into a more natural state in the hope of healing the planet.

Principle 10: Appropriate technology
In this principle, "appropriate" refers to its' relation to the local culture. For instance, use of implements that are locally made, can be repaired locally, and made use of with the skills of local people. Also, there should be less reliance on fossil fuels.

Principle 11: Scale
A return to smaller scale agriculture. This is to attempt to balance with technical diversity.

Mollison's Permaculture Laws

(1) Everything is connected to everything else.

(2) Everything gardens.

(3) The yield of a system is theoretically unlimited. Limit is only the imagination and experience of the designer.

(4) "Protracted and thoughtful observation, rather than protracted and thoughtless labour."

(5) The problem is in the solution, or everything works both ways. Problems turned into assets and wastes into resources.

(6) Stay out of the bush; it is already in good order.

(7) Work with nature instead of against it.