

## **Chapter 4: Permaculture principles, strategies, tactics, and the occasional wisdom saying.**

Before we can look at the application of permaculture to food systems in particular, we need to talk a bit about permaculture in general.

Permaculture is a holistic discipline that seeks to design/create sustainable human habitations that incorporate the three permaculture ethics:

- ★ Care for people.
- ★ Care for the planet.
- ★ Acceptance of voluntary limits and fair distribution of surplus

These three ethics inform all of our permaculture design work. Taken together, they offer a secular ethical framework that transcends the traditional divisions/categories of human organization. Permaculture has universal applicability; it works for people in cities, and for people in rural areas, and all points in between. It is useful for people with acreage, small city lots, or who live in high-rise apartments.

Permaculture is intentional. It is not accidental. This is a key distinction.

Most of us lead “accidental lives”. That is, we go forward without a lot of thought as to the ways and means of our daily doings. We do things because that’s the way we’ve always done things, because we are influenced by our family, our neighbors, our friends, or by advertising campaigns. If we want water, we turn on the tap and out gushes pure water. If we want heat, we turn up the thermostat. If we want cool, we turn on the air conditioner.

But no man or woman is an island, and no action exists in and of itself, by itself, without consequences. Each human action sets in motion a chain of events. Let’s consider the activities mentioned in the previous paragraph.

- ★ Turning on the water draws down the city water supply, which causes pumps to move more water, and purification systems to increase their activity and energy loads. Pumps and purification systems require electricity and machinery, and their maintenance and capital investment set in motion another chain of manufacturing, transportation, and energy events extending to the far corners and deep depths of the earth.
- ★ Turning up the thermostat in winter, or turning on the AC in the

summer, increases the load on energy production and distribution systems. These activities require capital investments and maintenance, all of which set in motion another chain of far-reaching events that delve deep into the earth and stretch across the continents.

Our actions have consequences – for better or for worse or for points somewhere “in between”.

Our daily “livings” embody energy in the even the simplest tasks. It’s been said that even a low-level modern life is made possible by the “energy equivalent” of hundreds of slaves. If you doubt this statement, then turn off your automobile, put it in neutral, and push it up a hill. Even better, get behind an 18 wheel truck and push it up a hill. How many people pushing would it take to get an 18 wheeler up to 55 miles an hour, going uphill?

For all of our lives, energy has been cheap and our political and economic systems here in the developed world have enabled us to avoid the costs and the consequences of our lifestyles of the energy rich and self-entitled. Costs are externalized, profits are privatized, and risks are socialized. Nice work, as they say, if you can get it, and there generally hasn’t been a problem with this process. Well, “hasn’t been a problem” as long as you were somewhere close to the top of the global food chain, which is certainly the case for us in these united States of America.

But lately, it seems as though the bloom has fallen off the rose of the modern project.

The problem with externalized costs is that they don’t actually go away, they just aren’t accounted for on our balance and income/expense sheets. Also nice work if you can get it, but how long could a business stay solvent if its managers simply ignored their costs? Not very long. Sooner or later, all costs will be accounted for and paid, and that includes all of the costs we have been externalizing this past century or so.

If you wonder what is happening all around us these days, look no further than the front door where a certain persistent piper is knocking loudly, demanding payment for all the costs we thought we had so cleverly avoided. Everywhere we go, we are paying more, and getting less, and that trend will only intensify going forward..

Let’s hop into the “Way-Back Machine” and visit Chaco Canyon in northwestern New Mexico, about a thousand years ago. For 250 years or so (900 to 1150 AD), this area contained a thriving civilization. They

created 15 major centers, which incorporated the largest buildings built in North America until the 19<sup>th</sup> century. Pueblo Bonito is about the size of the Roman Coliseum! They built a network of nearly 200 miles of roads, 30 feet wide, imposed on the landscape and apparently oriented in accordance with the positions of the moon.

In their beginning, there were dense forests in the area, which provided plentiful resources for building projects. But as population and social complexity increased, resources became more scarce as they were converted into buildings, fuel, and artifacts. It is thought that the buildings of Chaco Canyon required the timber of more than 200,000 trees! People had to go further and further afield to find timber and other necessary items for their lifestyle. But even so they muddled along, until in 1130 AD, a 50 year drought began. By 1140, the Chaco Canyon civilization was in disintegration. Communities along the periphery of their area were abandoned, and by 1200 AD, the entire region was depopulated. It is thought that most of the survivors migrated south and east and became the ancestors of the various Pueblo Indians of New Mexico.

The archeological evidence suggests that as the resources became more constrained, their solution of choice was to make even greater investments in the complexity of their civilization. There were increasing numbers of small settlements founded, there was a burst of building activity in the central regions involving perhaps the doubling of the labor requirements, new villages were located in more marginal areas, and the functional specialization of buildings increased. In other words, as they faced grave crises and stresses, they responded with “more of the same”. They were making ever-greater investments in social and economic complexity, but ***their return on their investment steadily declined***. One of the characteristics of late Chacoan architecture is large storage rooms, thought to be a result of the increasing problems they were experiencing with food production.

The 50 year drought (1130-1180) appears to be the proverbial straw that broke the camel’s back. The Chacoans had survived severe droughts several times during their history, but those were in earlier years – population was lower, biological diversity in the area was higher, the “resource bank” was not quite so empty.

Even so, they were not without alternatives. For example, they could have mobilized their population to carry water, pot by pot, from the rivers that remained flowing to their fields. They did not do this because they had finally reached the point of no return in terms of their investment in even more complexity. Imagine the amount of

organization and effort (and resources!) required to carry enough water in pots for the needs of thousands of people! The drought expedited existing trends by sharply increasing the rate of the decline of the return on their investments in complexity.

OK, that was Chaco Canyon, in our modernity we soothe our fears by whispering to ourselves – “They were geographically constrained, and did not have the knowledge advances we have today.”

Now let’s look at Rome.

The fall of the Roman Empire is one of the most studied events in human history. It is not an event that happened on one day, but was instead a process that extended over a long period of time. The Roman Empire “in the beginning” made a profit by conquering surrounding peoples, looting their riches, and investing those riches in increased social and economic complexity at home. By the time of Augustus, however, the rich countries suitable for conquering had all been looted. Greece, Egypt, Carthage, all were drained. The Persians weren’t interested in being Romans and thus provided an eastern limit border for the empire as well as a several hundred year long series of “hot” and “cold” wars. To the west was the Atlantic Ocean, north were various barbarians who lacked the ready wealth that the Romans coveted in their targets for military expansion. The southern coast of the Mediterranean was already in hand, and beyond that was an apparently endless desert of sand devoid of lootable riches. What’s the point in going to war without rich cities full of gold and silver that could be carried away? Indeed, who could afford to go to war without the prospect of cities to loot?

But even so, the decline in the return on their investments in complexity was not sharp enough to produce collapse early in the process, all things considered. Well into the 2<sup>nd</sup> Century AD, the Roman Empire was generally holding together. But stresses and crises multiplied – today we would refer to these events as “Black Swans.” Barbarian invasions, plague, weather disasters, all began to take a toll on the economy and the people. When wealth in the form of buildings, productive land, trained personnel, or experienced farmers, was destroyed by war, weather, or government corruption, it was increasingly not easy to replace, especially since all they really had to go on economically was agricultural production.

Like the Chacoans, the Romans on-going response was “more investment in more complexity”. They externalized costs in the present onto future taxpayers by debasing their currency. This is a fine strategy as long as in the future, there are no more crises and thus people can afford

to pay the costs of past work. Oops. That didn't work out so well. So taxes were raised, and the lives of Romans and conquered peoples were regulated in minute details. Scapegoats were blamed and persecuted. And thus it came to pass that the barbarian invasion crises of the late fourth and early fifth centuries were terminal for the Roman state in the west.

For most people, the advantages of being Roman were no longer apparent, and in the countryside, barbarian invaders were often joined by the peasants and slaves who saw them as "liberators".

Joseph Tainter's book, "The Collapse of Complex Societies", is one of the best treatments of this subject, and I recommend it to everyone. His conclusion is that the collapse of civilizations happens when increasing investments in complexity bring greatly reduced returns. In each case that he studies in the book (Roman, Mayan, Chacoan), he finds that the collapse was immediately preceded by a surge of investment in complexity. At page 191 he writes, "Rome's collapse was due to the excessive costs imposed on an agricultural population to maintain a far-flung empire in a hostile environment." About Chaco Canyon, he says, "The regional population of the San Juan Basin chose not to continue participating in the Chaco Canyon network, nor to rise to the challenge of the final drought, because the costs of doing so had grown too high in comparison to the advantages conferred. Collapse and migration were economically preferable."

Neither the Romans nor the Chacoans had anything quite like permaculture -- an intentional, conscious design system based on the sustainability ethics of care for people, care for the planet, and voluntary limits -- to help them address and resolve the contradictions of their times that led to the demise of their civilizations. Permaculture can be fairly compared to the martial arts, in that it uses the overwhelming strength of the challenge as both an offense and defense leading to a positive resolution over the situation. Permaculturists often say "the problem may contain the solution."

This is not a top-down enterprise. It can't be imposed by the government or an international bureaucracy. It can only grow from the ground up, in ways that mimic the natural creation. A pasture does not transform itself to a mature climax forest overnight, nor does that transformation occur in one grand revolutionary change. By a process of natural succession, a prairie can evolve into a forest and then evolve back to a prairie, each part of the process growing organically from the previous, and as a response to the ever-changing aspects of the biosphere that are larger than any given site.

Permaculture is both art and science. It is rigorously rational and inherently intuitive. The science and rationality come from what we know about climate, the earth, the biology of plants, animals, humans, and the invisible structures that we human beings create. (Invisible structures = things like governments, laws, cultural and belief systems that are always found as part of human settlements and communities.) The intuition comes from the plain fact that there is much that we don't know about "all that is", especially when it comes to how systems and their parts interact. The power of "Black Swan events" which seemingly come out of nowhere to radically and rapidly change "normality", is not always understandable, even if all such events have antecedents and causes, however obscure.

## **PERMACULTURE PRINCIPLES AND STRATEGIES**

Permaculture does not have a pope; it is a decentralized system. It originates in the work of Bill Mollison and David Holmgren, and as a movement it is composed of various permaculture teaching "lineages" that derive from people who were trained by Mollison in the late 1970s and early 1980s. In my case, my permaculture teacher, Dan Hemenway, was one of the first practitioners authorized to offer permaculture training in North America by Bill Mollison.

Permaculture is a human cultural artifact, derived from our observation of nature and perception of the history of our species, that attempts to describe natural processes in human terms. The plan is that as we learn "how the system works", we will be able to make intelligent, conscious interventions to produce results consistent with the permaculture ethics.

In this respect, permaculture is like music theory, which is a set of rules that are rooted in observations of what constitutes "beautiful music" in various cultures. You can search, but you will never find an original Board of Musical Theory which developed all these rules about part writing and parallel fifths and etc. that we learn about when we study music. In other words, *first* we sang and *then* we wrote an explanation of why what we sang sounded so beautiful.

In permaculture, we observe and evaluate, and then on the basis of that analysis, we design, stage our response, and implement. That is the design process and it works whether you live in a high-rise apartment building or on a rural farm, whether you are young or old, rich or poor, or somewhere in between.

At this point, we should make a few statements about what permaculture is not, just to clear up a few of the many misunderstandings about

permaculture.

- ★ Permaculture is not about using perennial food producing plants in human landscapes – although permaculture designs may certainly incorporate such plants into their designs.
- ★ Permaculture is not gardening class – although permaculture designs often include gardens.
- ★ Permaculture isn't a collection of interesting and often beautiful artifacts like herb spirals or practices like composting, although permaculture designs often contain herb spirals and prescribe composting.

Permaculture is a design discipline that encompasses all aspects of a person's/household's life and ways of living. It shouldn't be limited to just one aspect of who and what we are.

This isn't to say that we can't look at the application of permaculture principles to specific situations. Our focus in this book is on food systems. My discussion of "kitchen permaculture" is because one way for people to learn about permaculture is by first looking at a specific aspect of their life, in this case, food. "Permaculturing your kitchen" should only be the first step towards the process of using permaculture principles to design a better way for you and your family to live in this world, a way that says that people and the planet both are important. About this more will be said in Chapter 5.

As a design discipline, permaculture uses tools – disciplines – principles, strategies, and tactics – to turn our observations and evaluations into concrete plans for action and implementation. One excellent statement of the principles and disciplines of permaculture design is in the article "Living Lovingly" by Dan Hemenway. Rather than try to reinvent the wheel in the discussion of permaculture principles, I suggest that folks read this article online at <http://www.barkingfrogspermaculture.org/livinglovingly.pdf> .

Besides disciplines and principles, there are also some common strategies and tactics used in permaculture design. The list which follows is my own, and it is not exhaustive, but it is based on the canon of permaculture knowledge and my own experiences.

## **STRATEGIES, TACTICS and the OCCASIONAL WISDOM SAYING**

- ★ Use entropy to achieve desired goals.

Nothing stays where you put it. Everything eventually falls apart. Each time energy changes there is a net loss of energy. The Laws of Thermodynamics are pitiless and inescapable and universal: You can't make a profit, you can't break even, you can't get out of the game. Since we can't escape or avoid entropy, we might as well recover something from the process. Rainwater can fall onto your roof, run off down the street and into the storm drain. Or it can fall onto your roof, and then be channeled into a rain harvesting system, which provides water for the household and an aquaculture system, and the water from the aquaculture system can then flow onto your garden areas to provide nutrient rich moisture that your plants need. This is a much better plan than just letting the rain hit your roof and then disperse its energy into the storm drains.

- ★ Make the least change for the greatest effect.

This goes along with the principle – if it isn't broken, don't fix it. We humans tend to like grand solutions that feature much bigness. Nature, on the other hand. . . well, consider the micro-flora and micro-fauna that do so much to enrich the soil. You need a microscope to see what's going on. No bigness or grandiosity there. So as you consider what changes you want or need in your life, first think small. We start small or we don't start at all.

- ★ Hold water and fertility as high on the property as possible.

Gravity is all around us, so you might as well use it. If you catch water at higher elevations (your roof for example) and use it at lower elevations (your garden), the water flows there without pumping. You may not have a choice, as (for example) your land may be flat as a pancake. But if you do have a choice, catch your fertility and water as high on your land as is practical and thus conserve the amount of energy required to move it around.

- ★ Energy conservation and efficiency. “Make hay while the sun shines.”

One of the critical issues for our civilization is that pretty much all of life as we know it is predicated on a cheap and endless supply of energy, but the reality of our world is that fossil fuel energy is neither cheap nor will it be endlessly available. In the coming years we will see the rock of the modern lifestyle meet the irresistible force of peak energy. Better get out of the way of that grind while the getting is good. Intelligent energy

conservation first begins with household demand destruction and finding non-fossil-fuel powered ways to provide energy needs. It does not start with ordering solar PV panels, although eventually that may be part of a permaculture plan. And when you think about conserving energy, don't forget "human energy".

★ Biology rules. "It's not nice to fool Mother Nature."

In fact, attempts to fool Mother Nature are inevitably doomed to failure. Yet, much of our modern is built on attempts to fool Mother Nature. We build the same house, using the same plans, whether we live in Portland, Maine or Los Angeles. We think we can use genetic modification techniques to finesse the crises of global climate change. We always expect that our technology will allow us to triumph over nature, but "consider the tornado" and what it can do to a modern city full of technology. Biology rules us humans too, we are living creatures. To expect us to act as machines is contrary to our nature, and not part of our vision of the future.

★ Everything cycles. "Waste not, want not."

This advice of our grandparents seems quaint in the use-once-and-throw-away culture in which we live. Since everything cycles, we should plan for that and use it in our designs. And "everything" does mean "everything." Sometimes this suggests changes in personal lifestyle so that we avoid items that are hard to cycle at present. Think "voluntary limits".

★ Design from patterns to details – "Look for the trees within the forest"

Can you see the forests among the trees – and the trees among the forests? Think about a spider's web – no two are exactly identical, yet they have a number of commonalities. When we look at nature, we see many patterns repeating, and this should suggest some ideas to us about our human design work..

★ Relative location – "A place for everything and everything in its place"

Permaculture uses "zones" as a way of developing the relative location of the individual elements of a design. Elements that require frequent maintenance or visits by the household should be placed conveniently. Thus, in many permaculture designs, the herb and kitchen garden is right outside the door closest to the kitchen. And within that garden, plants

that may need daily attention (“plucking plants” like lettuces or greens that are “cut and come again” and used frequently) will be closer to the kitchen door than plants like corn, which require much less frequent attention.

- ★ Plant succession and layers. “A mighty oak grows from a small acorn.”

First things first. Second things second. If you want to build a house, you start with the foundation, not the roof. If you want a food forest, you don’t plant trees “first thing”. Plant succession is easily found in nature, and if we harness its power in our designs, we will have better results.

- ★ The problem often contains the solution.

The Oklahoma Food Cooperative is an excellent example of this wisdom saying. There we were in 2002, with limited access to local foods. Out of that problem, with the actual application of a permaculture design process (although we didn’t really think of it as such in those days), grew the Oklahoma Food Cooperative, providing better access to local foods for hundreds of families every month.

- ★ The Keyline system

This strategy is mostly applicable to larger, rural properties, as most urban properties would not be large enough to use its methods. The keyline is where the “ridge meets the valley”, and the Keyline system, first described and published by P.A. Yeomans in the 1950s in Australia, is a method of water harvesting/conservation and land regeneration that is rooted in the observation of the ridges and valleys on a property and working with them, rather than against them, to achieve the goals of the farmer or the pastoralist.

- ★ Forest Gardens/perennial food production

A forest offers seven layers of potential food production:

- ★ Mature canopy trees (pecans, chestnuts, oaks, standard varieties of fruit trees),
- ★ Understory trees – redbuds, dwarf and semi-dwarf fruit and nut trees,
- ★ Woody shrubs and cane fruits – bush cherries, Siberian pea shrub, blackberries and etc.
- ★ Herbaceous plants – asparagus, bee balm, comfrey, dill, rosemary, sage, flowers, this list is very long.

- ★ Ground covers – sage, clovers, etc.
- ★ Roots – day lilies, Jerusalem artichokes, potatoes, sweet potatoes, peanuts, etc.
- ★ Climbing vines – grapes, passion fruit, kiwi fruit, etc.

- ★ Wait one year.

People look at this and go “huh?” We are a species in a hurry. The idea of waiting “a whole year” for something we greatly desire is at minimum frustrating. Yet, observation is the first stage of permaculture design, and good observation takes time. You can’t just drop in on a situation and watch things for a few hours and come away with a complete understanding of what is needed. A property needs to be observed through all the seasons of the year to understand how it interacts with its surroundings. “Wait one year” is a counsel of patience. As Dan Hemenway often says, “We don’t have time to be in a hurry.”

- ★ We are surrounded by insurmountable opportunities.

For all of our sometimes gloomy talk about the problems of this world, permaculture as a design discipline is inherently optimistic. Sure we are in a deep hole, but as we stop digging the hole deeper, and start thinking of ways out of the hole, the situation gets better. Every step towards a better future is, in fact, a step towards a better future.

- ★ Mistakes are tools for learning.

Sometimes we freeze ourselves into inaction, or languish in procrastination, because we are afraid to make a mistake. I often talk about the “more than 100 different varieties of useful or edible plants” that grow on my former lawns. But there is another list, equally long, of plants that I tried but that did not survive. No one is capable of perfect understanding in any situation. So just expect that you are going to make mistakes, and practice the ability to recognize your mistakes and get out of them quickly rather than continuing to make the mistake, over and over and over again, just because, you know, you made that decision and now figure you have to stick with it, even as the evidence mounts that it was the wrong thing at the wrong time in the wrong place.

## **THE INVITATION OF PERMACULTURE**

The invitation of permaculture is to become intentional in your ways and manners of living, to be engaged with your surroundings – your community, your family, your eco-system – and to incorporate ethics

that care for the Earth, care for people, and incorporate voluntary limits, into your life.

It no doubt seems complicated, but that's true of most skills or fields of knowledge when we first encounter them. There is nothing in permaculture that is completely outside of your field of reference or experience, the unique contribution of Bill Mollison, David Holmgren, Dan Hemenway, Scott Pittman, and other permaculture thinkers and teachers is to remember, find, collect, synthesize, and then present cultural and ecological knowledge so that we can learn to make better decisions about how we live together in community on this planet.

What is required is a conscious decision to make the effort to incorporate the permaculture ethics into your life. Once that commitment is made, a lifetime of permaculture learning and experience and risk-taking opens up opportunities you never before thought possible. Through permaculture design, we can work together to increase the safety, security, well-being, and happiness of our families and communities.