**Permaculture in Edible Urban Gardens - *by Charles Otway from Terra Perma.***

**What is Permaculture** - An ecologically grounded design science to develop solutions to allow humans and nature to co-exist in a regenerative and long term future.

**The ethical (people care/earth care/fair share/limits aware) basis of permaculture sets it apart** from many other sciences, horticulture, agriculture, etc, which are purely a one minded way to grow plants, grow food. Permaculture's founder Bill Mollison equates this to asking the question in a different manner. Instead of looking at land and saying what can I take from this land, instead ask what does this land have to give. The first immediately puts you at war with nature and in competition, the later directs and encourages us to work with nature to increase the yield of the system for both parties.

So it is that simple. Not what can I take from this system, but what does this system have to offer (as a surplus yield). It is also basic economics we don't spend the capital, we invest the interest created by the capital.

**Permaculture provides positive and empowering solutions** to many of our problems, it puts you in charge of your food production, your recycling, your carbon footprint, your families health and wealth and it creates opportunities for meaningful and rewarding employment. We don't sit around worrying global warming (we are busy planting tropical trees), we just get on with our lives and create the evidence to inspire others that the solutions a very simple. We use regenerative practices, going beyond sustainability as we don't wish to sustain this stage of humanity drowning in problems.

**Permaculture has stereotype issues** techniques and a hippy subsistence lifestyle hangover, however it is the design system fused with ecological science that is what permaculture is about. Permaculture is a world science and thus ideas have been taken from different landscapes and climates, thus similar to the hangovers we have still copying European farming and gardening techniques in Perth, using the wrong permaculture techniques like herb spirals, raised beds, rain water tanks, and summer sheet mulching in Perth are people copying techniques and blaming permaculture on their failure, rather than understanding systems and ecologies.

Today I would like to get you avoiding copying techniques and asking to be spoon fed the next sales pitch by experts.

To do this we will guide ourselves and our design thinking with one of the twelve permaculture principles coined by David Holmgren, these acting as a cheat sheet to ecological permaculture design.

**We design from Patterns to Details.** The technique of a Herb Spiral is a detail, but we need step back to the patterns, sun, rainfall, soil, growth patterns before we decide that Herb Spirals are a good option.

Designing from Patterns to details might be more easy to understand as from Broad to Specific, we deliberately take off the garden owners hat and wear an ecological designers hat. These patterns are the controlling and limiting factors of your garden, farm or works place. Patterns are most easily understood as the ways nature has evolved over long periods to solve problems, efficient resource transport (dendritic), nutrient cycling (animal migration, land formation), seed/resources storage (Fibonacci/hemispheres - sunflower - spirals)

If we build a sand castle on the beach we understand full well that the natural forces of wave action and tide will reduce it back to beach, yet we design gardens, farms, homes and urban environments ignoring these driving forces.

**In a small urban backyard in Perth we design everything from the house, to the food production area based on one force, the sun.**

For the moment the suns energy is free. Every day and plants grow as a by product of being there. We get rain 3-4 months of the year and in urban areas have access for the rest of the year to scheme or bore water, thus, while it needs to be used wisely we have water all year. If your garden is based on plant systems and has been set up to encourage and utilise resources sharing (soil, water, sun) the yield of your system is theoretically unlimited. Fertility and growth increases every year, harvest and yield increases accordingly.

So what are we doing wrong such that we need to buy $100's of dollars of fertiliser every year and the more plants we have the more fertiliser we seem to buy ?

We are just planting whatever we want, where ever we want, in crappy sand and watering it into oblivion. Poor soil, Hot dry summers, busy lifestyles, and a disconnected money driven community also work hard to restrict our gardening success.

**On larger blocks, and farms water trumps sun as the primary design driving factor**, but on urban blocks we have water on tap or a hose providing water where ever we need it for no cost.

Analysis of the sun drives Perth Urban permaculture designs, it should define home alignment, summer and winter growing areas, tree heights and relative location, placement of deciduous and evergreen species, location of sheds, water tanks and all infrastructure.

**Other wild energies and directional factors are all documented and designed into a garden by the use of a sector plan.** Sun angles in Summer and winter, Cooling breezes, fire directions, desirable views and other details are arranged around your site and this overlay is used as one of the factors defining the layout of elements.

Other design tools we use to figure out element (all the things in the garden) placement and integration are, nutrient cycling, zoning, element or niche analysis and change in time analysis.

**How your garden cycles its waste and nutrients is priority design factor or force in Perth**. Our poorly mineralised deep free draining sandy soils must have a diverse and well planned nutrient cycling system to succeed. Essentially a garden should increase in fertility, carbon mass and thus yield/harvest each year. However to achieve this in our soils we need to develop interacting plant, animal and soil ecologies that can grow, trapping sun, water and carbon, all the while living and dying and mulch down and recycle these nutrients/lives back in a 'closed loop'.

Chickens, rabbits, worms and composting present the most effective and common ways of recycling our organic matter in an urban backyard. Putting your scraps through another animal adds biodiversity to the 'product'. To improve the efficiency of this 'recycling' we should locate the 'power house' of the garden near its food source. Position your chooks/worm/compost beside your veggies, and within reaching distance of the morning/evening food scraps drop. The deep litter in a chicken run acts as a nappy to absorb ammonia and nitrate of chook poo, it also gives a place for the chooks to bury and compost your veggie scraps they don't fancy. They turn compost for fun !

We are always looking to remove the gardens dependence on us, that is work, and even if we like work we don't want to create gardens dependant on us for their success. Consider allowing the chickens access to the scraps/food rather than taking it to them each day. Mobile animals and plants have the advantage of less pest build-up.

We do eat part of the yield of our gardens and thus if this leaves via the sewer we need to replace those nutrients. While carbon, nitrogen and sunlight can replenish, minerals and trace elements are continually harvested/lost from the system. Adding rock minerals (basalt, granite and ore dusts) and sea minerals (kelp, oyster shells, fish hydrolysate) to your manages this loss. Lets value add this remineralisation by copy natures technique, instead of putting kelp and rock dust in your garden, feed it to your chooks, then compost their manure and bedding and add that complex diverse remineralisation to the garden.

**The number one rule of gardening, cover the soil ! Also remember that 'we' feed the soil microbes and fungi and they in turn feed the plants**, using highly mobile strong NPK is the best way to break your naturally functioning soil ecology and make weak plant. Plants make sugars, 1/3 more than they need, this excess is traded with soil life for minerals. Most soil life cant photosynthesis so they get their sugars from plants. Consider yourself a soil farmer or a sunlight farmer and you will be on the right track.

**Everything is connected**, appreciating but not needing to understand this, we making small changes at a time and observing the system reaction. The best solution is the simplest and smallest change to achieve the aim, slow small changes avoid long large headaches later. TAPO, Thoughtful And Protracted Observation, prevents protracted and thoughtless labour.

**Zoning** is a no brainer logical idea, place elements in the design as close to you as their dependency or frequency of interaction requires. Seedlings, chickens, wormfarms, daily greens and herb beds need to be located within reach of your daily loop (on the way to and from the car to get to work). An exception to this easy routine will inevitably be forgotten on busy days and fail/die. Fruit trees and perennial veggies can be at the back of the garden where weekend visits will provide enough interaction.

**Element analysis and niche analysis** is a way of looking at every individual element in your garden and documenting/appreciating its intrinsic characteristics, needs and outputs/functions. The idea is after noting this down for each element you start to see patterns of needs of one element meeting the outputs of another, the more you can locate these element together the more inherently (ecologically) stable the relationship will be. These kinds of groupings could be called a resource sharing guild, its an extension of companion planting.

Think Mulberry tree, and chickens, a match made in nature. I planted mustard greens to manage nematodes, these acted as a trap crop for hundred of white moth caterpillars, being the observer I left them alone. Soon dozens of paper wasps (predators) breed up on the pests, it was at that point that my high value broccoli and Kale was starting to grow well. So I cut the mustard, left it to wilt, the food for the wasps was stopped so they very diligently began hunting on the higher value Kale and Broccoli removing small caterpillars before I sustained any losses. Everything is connected, long and protracted observation !

**Some ecological rules to add to your design basis** stemming for Five Kingdoms thinking. No one species eats its own waste...(except dogs yes I know, gross), whatever is a toxin for one kingdom is a nutrient for at least one other, the more diverse and local the systems the more effective and resilient their operations. It is all basic stuff we already know but how many human systems are designed this way ?

Janine Benyus a Biomimicry, Keynote Speaker summarised this more "Nature runs on sunlight. Nature uses only the energy it needs. Nature fits form to function. Nature recycles everything. Nature rewards cooperation. Nature banks on diversity. Nature demands local expertise. Nature curbs excesses from within. Nature taps the power of limits."

**Change in time**, the only thing that stays the same is the fact that nothing stay the same ? Functional garden design must allow the system to evolve with time, nature is always moving from eroded exposed soil, to grass land, to bushland, to long term forest. It is no wonder that people like my neighbour over the road wanting his rose garden to look the same year after year are fighting ecological warfare with nature every day. An old Chinese proverb says "When the winds of change blow some people build walls and some build windmills." What are you building ?

So, I have not told you what to do, but hopefully how to approach the journey. Give someone a fish they eat for a day, teach them to fish they can eat for a life time. Hopefully I have got your thinking about the ecological driving forces effecting your garden and food growing all day every day. Harness them or fight them.

And honestly if you have success and fun working with nature, you will learn all the rest of the site specific gardening and plant based details by just enjoying gardening.

If you must copy something ( as we humans do) start with some of natures tried and tested blueprints, not that latest man made money making fad. Corrugated iron raised beds, aquaponics, inedible landscaping plants, and vertical gardens, I am looking at you !