Extracts from Permaculture: A designers Manual

Bill Mollison - 1988

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PRINCIPLES SUMMARY

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The Prime Directive of Permaculture: The only ethical decision is to take responsibility for our own existence and that of our children's.

Principle of Cooperation: Cooperation, not competition, is the very basis of future survival and of existing life systems.

The Ethical Basis of Permaculture:

1. CARE OF THE EARTH; Provision for all life systems to continue and increase.
2. CARE OF PEOPLE: Provision for people to access those resources necessary to their existence.
3. SETTING LIMITS TO POPULATION AND CONSUMPTION: By governing our own needs, we can set resources aside to further the above principles.

Rules of Use of Natural Resources:

- Reduce waste, hence pollution;
- Thoroughly replace lost minerals;
- Do a careful energy accounting; and
- Make a biosocial impact assessment for long term effects on society, and act to buffer or eliminate any negative impacts.

Life Intervention Principle: In chaos lies unparalleled opportunity for imposing creative order.

Law of Return:

- Whatever we take, we must return, or
- Nature demands a return for every gift received, or
- The user must pay.

Directive of Return: Every object must responsibly provide for its replacement. Society must, *as a condition of use*, replace an equal or greater resource than that used.

Set of Ethics on Natural Systems:
- Implacable and uncompromising opposition to further disturbance of any remaining natural forests;
- Vigorous rehabilitation of degraded and damaged natural systems to a stable state;
- Establishment of plant systems for our own use on the least amount of land we can use for our existence;
- Establishment of plant and animal refuges for rare or threatened species.

The Basic Law of Thermodynamic (as restated by Watt];
"All energy entering an organism, population or ecosystem can be accounted for as energy which is stored or leaves. Energy can be transferred from one form to another, but it cannot disappear, or be destroyed, or created. No energy conversion system is ever completely efficient:
As stated by Asimov (1970)); "The total energy of the universe is constant and the total entropy is increasing."

Birch's Six Principles of Natural Systems:
1. Nothing in nature grows forever. There is a constant cycle of decay and rebirth.
2. Continuation of life depends on the maintenance of the global bio-geochemical cycles of essential elements, in particular carbon, oxygen, nitrogen, sulphur, and phosphorus.
3. The probability of extinction of populations or a species is greatest when the density is very high or very low. Both crowding and too few Individuals of a species may reach thresholds of extinction.
4. The chance that a species has to survive and reproduce is dependent primarily upon one or two key factors in the complex web of relations of the organism to its environment.
5. Our ability to change the face of the earth increases at a faster rate than our ability to foresee the consequence of change.
6. Living organisms are not only means but ends. In addition to their instrumental value to humans and other living organisms, they have an intrinsic worth.

Practical Design Considerations:
- The systems we construct should last as long as possible, and take least maintenance.
- These systems, fueled by the sun, should produce not only their own needs, but the needs of the people creating or controlling them. Thus, they are sustai-nable, as they sustain both themselves and those who construct them.
- We can use energy to construct these systems, providing that in their lifetime, they store or conserve more energy than we use to construct them or to maintain them.

Mollisonian Permaculture Principles:
1. Work with nature, rather than against the natural elements forces, pressures, processes, agencies, and evolutions, so that we assist rather than impede natural developments.
2. The problem is the solution; everything works both ways. It is only how we see things that make them advantageous or not (if the wind blows cold, let us use both its strength and its coolness to advantage). A corollary of this principle is that everything is a positive resource; it is just up to us to work out how we may use it as such.
3. Make the least change for the greatest possible effect.

4. The yield of a system is theoretically unlimited. The only limit on the number of uses of a resource possible within a system is in the limit of the information and the imagination of the designer.
5. Everything gardens, or has an effect on its environment.

A Policy of Responsibility (to relinquish power): The role of beneficial authority is to return function and responsibility to life and to people; if successful, no further authority is needed. The role of successful design is to create a self-managed system.

Categories of Resources:
1. Those which increase by modest use.
2. Those unaffected by use.
3. Those which disappear or degrade if not used.
4. Those reduced by use.
5. Those which pollute or destroy other resources if used.

Policy of Resource Management: A responsible human society bans the use of resources which permanently reduce yields of sustainable resources, e.g. pollutants, persistent poisons, radioactive, large areas of concrete and highways, sewers from city to sea.

Principle of Disorder. Any system or organism can accept only that quantity of a resource which can be used productively. Any resource input beyond that point throws the system or organism into disorder; oversupply of a resource is a form of chronic pollution.

Definition of System Yield: System yield is the sum total of surplus energy produced by, stored, conserved, reused, or converted by the design. Energy is in surplus once the system itself has available all its needs for growth, reproduction, and maintenance.

The Role of Life in Yield: Living things, including people, are the only effective intervening systems to capture resources on this planet, and to produce a yield. Thus, it is the sum and capacity of life forms which decide total system yield and surplus.

Limits to Yield: Yield is not a fixed sum in any design system. It is the measure of the comprehension, understanding, and ability of the designers and managers of that design.

Dispersal of Food Yield over Time:
- By selection of early, mid and late season varieties.
- By planting the same variety in early or late ripening situations.
- By selection of long-yielding varieties.
- By a general increase in diversity in the system, so that
- Leaf, fruit, seed and root are all product yields.
- By using self-storing species such as tubers, hard seeds, fuel wood, or rhizomes which can be '"cropped on demand"'.
- By techniques such as preserving, drying, pitting, and cool storage.
- By regional trade between communities, or by the utilization of land at different altitudes or latitudes.

Principle of Cyclic Opportunity: Every cyclic event increases the opportunity for yield. To increase cycling is to increase yield.
Cycles in nature are diversion routes away from entropic ends-life itself cycles nutrients-giving opportunities for yield, and thus opportunities for species to occupy time niches.

Types of Niches:
- Niche in space, or "territory" (nest and forage sites).
- Niche in time (cycles of opportunity).
- Niche in space-time (schedules)

Principle of Disorder: Order and harmony produce energy for other uses. Disorder consumes energy to no useful end.
Neatness, tidiness, uniformity, and straightness signify an energy-maintained disorder in natural systems.

Principle of Stress and Harmony:
Stress may be defined as either prevention of natural function, or of forced function; and (conversely) harmony as the permission of chosen and natural functions and the supply of essential needs.

Principle of Stability: It is not the number of diverse things in a design that leads to stability, it is the number of beneficial connections between these components.
Information & Resources : Information is the critical potential resource. It becomes a resource only when obtained and acted upon.

THE ESTABLISHMENT AND MAINTENANCE OF SYSTEMS

Bill Mollison – Permacuture: A designers Manual – pages 65-69

Every design is an assembly of components. The first priority is to locate and cost those components. Where our resources are few, we look closely at the site itself, thinking of everything as a potential resource (clay, rock, weeds, animals, insects). We can think of labor, skill, time, cash, and site resources as our interchangeable energies: what we lack in one, we can make up for by exchange for another (e.g. clothes-making in exchange for roof tiles). The best source of seed and plants is always neighbors, public nurseries, or forestry departments. From the early planning stages, it pays to collect seed, pots, and hardy cuttings for the site, just as it pays to forage for second-hand bricks, wood, and roofing.

The planning stage is critical. As we draw up plans, we need to take the evolution in stages, to break up the job into easily-achieved parts, and to place components in these parts that will be needed early in development (access ways, shelter, plant nursery, water supply, perhaps an energy source). Thus, we design, assess resources, locate components, decide priorities, and place critical systems. Because impulsive sidetracks are usually expensive, it is best to fully plan the site and its development, changing plans and designs only if the site and subsequent information forces us to do so.

On a rural (and sometimes urban) site, FENCING or hedgerow, SOIL REHABILITATION by mulch (or loosening by tools), EROSION CONTROL, and WATER SUPPLY are the essential l precursors to successful plant establishment, for we can waste time and money putting out scattered plants in compacted, impractical, and dry sites. Any soil shaping for roads, dams, swales, terraces, or paths needs to be finalized before planting commences.

For priority in location, we need to first attend to Zone 1 and Zone 2; these support the household and save the most expense. What is perhaps of greatest importance, and cannot be too highly stressed, is the need to develop very compact systems. ln the Philippines, people are encouraged to plant $4m^2$ of vegetables -a tiny plot- and from this garden they get 40-60% of their food! We can all make a very good four meters square garden, where we may fail to do so in 40 square meters.

Similarly, we plant and care for ten critical trees (for oils, citrus, nuts, and storable fruit). We can take good care of these, whereas if we plant one hundred or one thousand, we can lose up to 60% of the trees from lack of site preparation and care. Thus, ten trees and four square meters, well protected, manured, and watered, will start the Zone I system.

Starting with a nucleus and expanding outwards is the most successful, morale-building, and easily-achieved way to proceed. Broadscale systems have broadscale losses and inefficiencies. As I have made every possible mistake in my long life, the advice above is based on real-life experience. To sum up:

- Design the site thorough y on paper.
- Set priorities based on economic reality.
- Locate and trade for components locally or cheaply.
- Develop a nucleus completely.
- Expand on information and area using species proved to be suited to site.

Precisely the same sort of planning (nucleus development) applies to any system of erosion control, rehabilitation of wildlife or plants, writing books, and creating nations. Break up the job into small, easily achieved, basic stages and complete these one at a time. Never draw up long lists of tasks, just the next stage. It is only in the design phase that we plan the system as a whole, so that our smaller nucleus plans are always in relation to a larger plan.

Instead of leaping towards some imaginary end point, we need to prepare the groundwork, to make modest trials, and to evolve from small beginnings. A process of constant transition from the present to the future state is an inevitable process, modest in its local effect and impressive only if widespread. Thus, we seek first to gain a foothold, next to stabilize a small area, then to develop self-reliance, and only after this is achieved to look for exportable yields or commercial gain.

Even in a commercial planting it is wise to restrict the total commercial species to 3-10 reliable plants and trees, so that easier harvesting and marketing is achievable, although the home garden and orchard can maintain far greater diversity of from 25-75 species or more.

Thus, our design methodologies seek to take into account all known intervening factors. But in the end it comes down to flexibility in management, to steering a path based on the results of trials, to acting on new information and to continuing to observe and to be open or non-discriminatory in our techniques.

The success of a any design comes down to how it is accepted and implemented by the people on the ground, and this factor alone explains why grand centralized schemes more often result in ruins and monuments than in stable, occupied, and well- maintained ecologies.

We can design any expensive, uncomfortable, or ruinous system as long as we do not have to live in it, or fund it ourselves. Responsible design arises from recommending to others the way you have found it possible to work or to live in a similar situation. It is much more effective to educate people to plan for themselves than to pay for a permanent and expensive corps of "planners" who lead lives unrelated to those conditions or people for whom they are employed to design.

GENERAL PRACTICAL PROCEDURES IN PROPERTY DESIGN

Except for the complex subject of village design, a property design from one-fourth to 50 ha needs firstly a clear assessment of "client or occupier needs", and stated aims or ideas from all potential occupiers (including children). A clear idea of the financial and skill resources of occupants is necessary so that the plan can be financially viable.

With a base map, aerial photograph, or a person as a guide, the designer can proceed to observe the site, making notes and selecting places for:

- Access ways and other earthworks;
- Housing and buildings;
- Water supply and purification, irrigation;
- Energy systems and
- Specific forest, crop, and animal system placement.

All the above are in relation to slope, soil suitability and existing landforms. By inspection, some priorities may be obvious (fire control, access, erosion prevention). Other factors need to be tackled in stages as time, money, and species permit. At the end of each stage, trial, or project, both past performance and future stage evolution should be assessed, so that a guide to future adjustments, additions, or extension is assembled as a process. In all of this, design methodologies plus management is involved, and it is therefore far better to train an owner-designer who can apply long-term residential management than to evolve a roving designer, except as an aide to initial placements, procedures, and resource listings.

The restrictions on site use must first be ascertained before a plan is prepared or approved. In the matter of buildings, easements, health and sewage requirements, permits, and access there will probably be a local authority to consult. If water (stream) diversions are foreseen, state or federal authorities may need to be consulted.

The homely, but probably essential process of building up real friendship between residents, designers, official s, and neighbors should be a conscious part of new initiatives. Small local seminars help a lot, as district skills and resources can be assessed. There is no better guide to plant selection than to note district successes, or native species and exotics that usually accompany a recommended plant. Nearby towns, in gardens and parks, often reveal a rich plant resource.

As every situation is unique, the skill of design (and often of market success) is to select a few unique aspects for every design. These can vary from unique combinations of energy systems, sometimes with surplus for sale, to social income from recreational or accommodation uses of the property. This unique aspect may lie in special conditions of existing buildings, vegetation, soil type, or in the social and market contact of the region. Wherever occupants have special skills, a good design can use these to good effect, e.g. a good chemist can process plant oils easily.

A design is a marriage of landscape, people, and skills in the context of a regional society. If a design ended at the physical and human aspects, it would be still incomplete. Careful financial and legal advice, plus an introduction to resources in these areas, and a clear idea for marketing or income from services and products (with an eye to future trends) is also essential.

Over a relatively short evolution of three to six years, a sound design might well achieve:

- Reduction in the need to earn (conservation of food and energy costs).
- Repair and conservation of degraded landscapes, buildings, soils, and species at risk.
- Sustainable product in short -, medium-, and long-terms.
- A unique, preferably essential, service or product for the region.
- Right livelihood (good work) for occupants in services or goods.
- Sound and safe legal status for the occupiers.
- An harmonious and productive landscape without wastes or poisons.
- A cooperative and information-rich part of a regional society.

These then, or factors allied to them, are the test of good design over the long term. For many regions, a designer or occupant can provide species (as nursery), resources (as education), services (as food processing or lease), or simply an example of sustainable future occupations. Pioneer designers in a region should seek to capitalize on that pioneer aspect, and provide resources for newcomers to the region.

PRINCIPLE SUMMARY

Definition of Permaculture Design: Permaculture design is a system of assembling conceptual, material, and strategic components in a pattern which functions to benefit life in all its forms. It seeks to provide a sustainable and secure place for living things on this earth.

Functional Design: Every component of a design should function in many ways. Every essential function should be supported by many components.

Principle of Self-Regulation: The purpose of a functional and self-regulating design is to place elements or components in such a way that each serves the needs and accepts the products, of other elements.