Mini Series: Permaculture element technology (1)

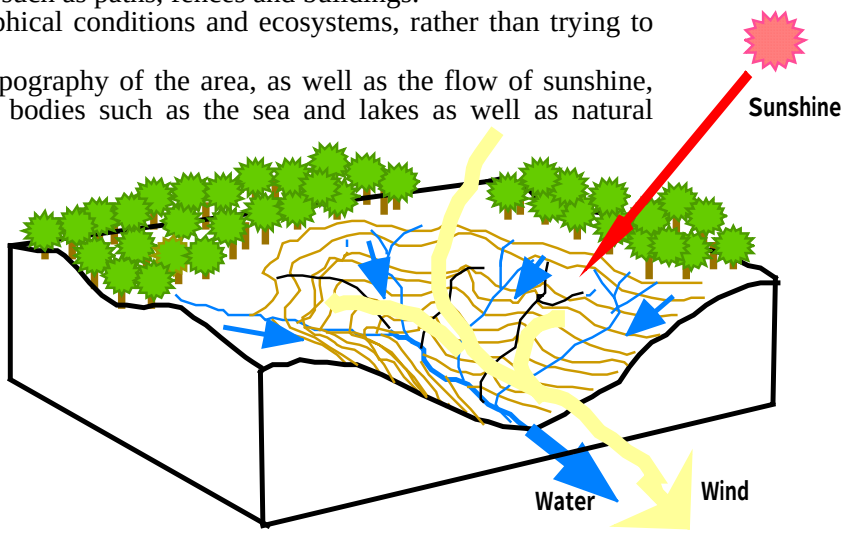
Part 1: Comprehensive planning with an overview

Permaculture involves the creation of a life-support system within a minimum available area of land, whether rural or urban, by making full use of the particular characteristics of local fauna and flora and other conditions such as existing buildings and the environment. We reported on one such example from Zimbabwe in AAINews Vol. 21, and from this issue we would like to run a new mini-series about the elemental technologies of permaculture. Before discussing individual technologies, it is necessary to have an overview. This is because each element composing a permaculture system, such as houses, roads, ponds, farms, forests and so on, does not exist independently, and it is important to understand how different elements are related to each other. As listed below there are some basic principles in permaculture designing, applicable to any climatic or spatial conditions, and a comprehensive plan for the proposed permaculture site must be made only after mastering said principles.

Basic principle	Description
Inter-relational positioning of each element	By positioning elements involved in the places where they can support each other, the whole system can function efficiently. For example, windbreaks around a house should be placed in such a way that they obstruct winds but do not obstruct sunshine in winter.
Extraction of multiple functions of each element	It is necessary to select the right elements and place them in the right places. For example, a pond can be multi-functional when used for irrigation, supplying water for cattle, fire prevention, fish farm etc.
Complementary functions of different elements	Functions of different elements can be complemented by each other, especially in terms of water, food and energy supply. For example, the function of a solar power water heater can still be complemented when there is no sunshine by a firewood stove with a water heating function.
Efficient energy use planning	With proper methods, energy such as wind and sunlight can be obtained and utilized efficiently.
Stress on utilization of biological resources	Biological resources should be preferred to fossil fuel resources. For example, instead of using chemical nitrogen fertilizer, leguminous plants can be planted which can fix nitrogen in the soil.
Energy recycling	External natural energy such as water, solar power and wind power should be used and recycled by using a proper circulation system. For example, water can be utilized efficiently by placing a water reservoir at a height below which water flow can be used at many points, such as water tanks and power generators.
Small-scale intensive system	Most of the targeted land should be efficiently used and managed. For example, a forest with a proper strata of various species does not require much effort for management.
Utilization and acceleration of natural transition of flora	The process of natural transition should not be disturbed. This can be achieved by utilizing existing species or planting those species which can adjust to the particular place easily. For example, grass cutting in addition to weeding and ploughing will have the effect of mulching.
Ensuring biological diversity	Diversified cultivation should be preferred to monoculture. Growing a variety of useful plants helps prevent pest damage.
"Contact" effect - effect of two different environmental conditions contacting each other	Natural topographical conditions should be made full use of at the contact point between two different environments, where a great deal of biodiversity will be found. For example, by changing the shape or depth of a pond, different kinds of plants and fish can be accommodated in different parts of the pond e.g. in the deep areas and in the shallows.

The next step of permaculture site design is to establish a good comprehensive plan, for which the key points are as follows:

1) Conduct observation and survey in order to understand the limits and restrictions dictated by the existing conditions of the target site and resources available there. This can provide information to be used to decide locations of basic infrastructure such as paths, fences and buildings.
2) Make full use of the existing topographical conditions and ecosystems, rather than trying to manipulate them.
3) Fully understand the landscape and topography of the area, as well as the flow of sunshine, wind and the air. Utilize large water bodies such as the sea and lakes as well as natural vegetation (i.e. their functions of evapotranspiration, wind prevention and shade provision), and consider improvement of the soil condition by means of use of certain plants, grazing control, alteration by machinery and use of organic substances.
4) Make efficient use of water resources by means of collection, dispersion and deposit.
5) Plan disaster prevention facilities such as wind breaks or fire breaks in forests, in order to minimize damage caused by potential disasters like fire, earthquake and flood.



Energy flow