Mini-Series: Permaculture Element Technology (2)

Part 2: Effective use of water resources and structures

This page in the previous issue discussed comprehensive planning of permaculture with a good overview of the landscape including the energy flows such as sunshine, air, wind and water. This time we would like to discuss one example of collection and utilization of one of the energy sources, namely water, in a process called “water harvest”. Also below we report on a method of environmental mitigation by the use of some additional structures attached to the site’s main constructions.

Water for human use can be obtained from rainwater flowing on the ground, from groundwater (through wells), and from springs, rivers and so forth. One way of effective water use is to make the most of natural slopes existing between the water sources and the final destination of reservoirs, allowing the water to run down in many ways at the mercy of gravitational forces. For this method, diversion channels (slightly sloped ditches to guide the water in certain directions) and water pipes are used to lead the water to reservoirs. The watercourse shown in Photo 1 is not for straight collection and delivery of seasonal rainwater to the reservoir, but it is used to guide water gradually to the final destination with many small dams built along the watercourse. Water stops, stays and gathers in each dam, and the overflow moves to the next dam, till it reaches the final reservoir. Part of the water stopped at each dam slowly seeps into the ground, keeping the soil moist as well as the air moist. The water gathered in reservoirs is used for drinking by humans during the dry season, and in grazing areas it is used as drinking water for cattle as well as for wild animals.

Photo 1:Diversion channel

Photo 2:Water tank made of galvanized iron sheet

Another popular method of water harvest is to collect rainwater direct from roofs and deposit it into water tanks. Water tanks can be made from various materials, such as galvanized iron sheets (Photo 2), concrete, bricks covered with mortar, wood, clay, etc. It is also possible to harvest water directly from lakes, wadis (dry river beds), or from underground, with the help of water pumps.

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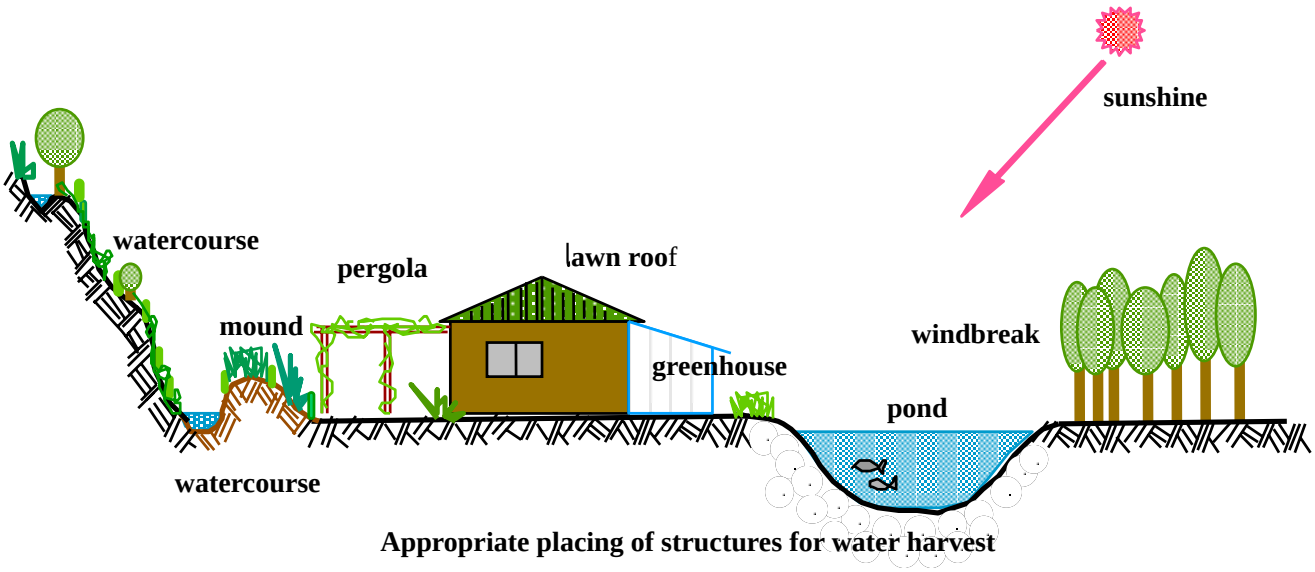
As for constructed objects, appropriate and effective use of additional structures around a housing complex such as mounds, greenhouses, fences, walls, pergolas etc. can help efficient energy use, by making the wind and temperature milder. A condition for effective house design is to harmonize the house with the natural energy sources such as sunshine, wind and rainfall, as well as the surrounding vegetation. It is important to place and design a house in accordance with the micro climate and environment, and just having some ivy overlooking the lawns, roof or walls and lattice trellises on the side of the house helps create a separate space for environmental mitigation and acts as a windbreak. Greenhouses and shade houses can serve for food production as well as for air-conditioning. Mounds have the effect of heat prevention, wind breaking and soundproofing, while groves also work as windbreakers. In any case, the whole point is to maximize efficacy of energy use by appropriate placing and designing of the structures within the targeted plot, and to control various climatic elements in the entire plot.



Appropriate placing of structures for water harvest