

# NEW AGRICULTURE

a Permaculture point of view

Venkat |



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**VENKAT**



New Agriculture  
*a Permaculture point of view*

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## *Introduction*

In recent years, there has been a tendency to seek solutions to our problems through human made technologies, 'science', packages, kits, and miracles. This is understandable since our approach to the problems has been and continues to be reductionist in nature. Only parts are considered in isolation and solution 'packages' are churned out.



In this background it is nothing surprising that Permaculture is also being taken as some 'package' or 'technology', which it is not from any view point.

What is not taken into consideration is that powerful living systems and biological processes govern and dominate on this planet, affecting all life forms and their needs for survival. Hence, it is in the working of these biological processes in the natural world that meaningful and lasting solutions have to be sought. Recourse to

technology based on non-living systems has only generated more problems, many of them irretractable. The most glaring one being the attempts to generate nuclear energy to solve our energy problem.

Today, we are having the environmental crisis on our laps and we cannot deny its presence. What we have to understand is what it MEANS. And where can we look for solutions? We need to ponder.

The meaning of the environmental crisis has to be understood first. It is rather very disturbing. Consider the following:

The means by which we are using the natural resources of the biosphere to produce wealth are destructive of the biosphere itself, because the means of gaining this wealth are governed by requirements conflicting with those that govern Nature. This reminds us of the fool in Aesop's Fables who cuts the very branch of the tree on which he is seated.

The devastation, depletion and destruction of the biosphere and its natural resources are taking place not due to the biological needs of the human race, but due to the rapacious needs of a social order based on power, greed, profit and exploitation, which deprives a majority of the world's peoples their basic necessities of life and human dignity.

This brutal social order needs for its existence a consumeristic way of life and has generated one such, a consumeristic way of life which guzzles more energy than what it generates. This energy coming from the mindless and rapacious use and exploitation of the natural resources of the very bio-sphere on which humanity dreams to have a peaceful existence.

Permaculture is a response and an alternative WAY OF LIFE, based on a cooperative and non-exploitative relationship with the bio-sphere and as a part of it.

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# Permaculture

**P**ermaculture movement has no central structure but has a strong sense of shared work towards evolving sustainable, ethical and viable systems for Earth and People Care.

The term was coined by Dr. Bill Mollison of Tasmania, Australia in the early 1970s to mean Permanent Agriculture or Permanent Culture. David Holmgren was a collaborator in this venture. Dr. Mollison was awarded the Right Livelihood Award (otherwise known as the Alternative Nobel Prize) in 1981, for this contribution in the search for alternatives.

It was initially conceived as a framework for a more permanent basis for agriculture rather than just the raising of annual crops. The idea was a beneficial assembly of multi-crop elements of perennial trees, shrubs, annuals (food crops), herbs, vegetables, useful weeds, fungi,





tuber crops with integration of animals, aimed towards household and community self-reliance for food sufficiency.

However, Permaculture has now come to mean much more than food sufficiency at household level, for, self-sufficiency in food becomes meaningless unless people have access to land, information and financial resources. Today Permaculture has come to mean a whole life system encompassing various strategies for people to acquire all those resources, including access to land needed to evolve self-financing and self-managed systems to provide for all their material and non-material needs, without depleting, polluting and destroying the natural resources of the biosphere.

Central to Permaculture is the relationship humans should have towards natural resources and their wise, ethical and judicious utilization so that posterity is not saddled with the consequences of our irresponsible conduct.

Today Permaculture has made a start all over the world, in some aspect or other, on some issue or other. Except in three countries of the world (Uruguay, Afghanistan and one African country) there are Permaculture groups, organizations, and individuals undertaking efforts, howsoever small to repair the Earth and become more responsible for their actions and enabling others to do likewise.

### **Permaculture Defined and its use**

“Permaculture is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter and other material and non-material needs in a sustainable way.”

“Permaculture design is a system of assembling conceptual, material and strategic components, in a pattern which functions to benefit life in all its forms.”

“The philosophy behind Permaculture is one of working with, rather than against, nature; of protracted and thoughtful observation rather than protracted and thoughtless action; of looking at systems in all

their functions, rather than asking only one yield of them; and of allowing systems to demonstrate their own evolution.”

**Bill Mollison,**

Permaculture, A Designer’s Manual

Based on this philosophy, the Ethical Basis – the code of conduct for people – is evolved and founded on

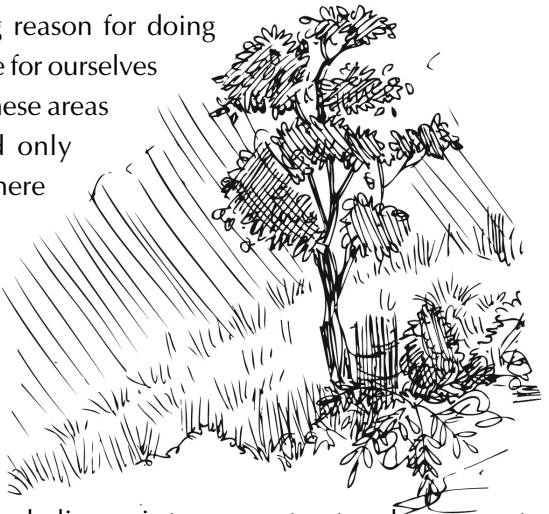
**CARE OF THE EARTH:** Provision for all life systems to continue and multiply.

**CARE OF THE PEOPLE:** Provision for people to access all those resources necessary for their existence.

**INVEST SURPLUSES** for above two: Varied are the needs for Earth Care; varied are the needs for People Care. All have to be attended to and solved.

However, Permaculture decides on some priority areas of human conduct. They being: to re-structure, and re-generate the areas of our habitation and settlement, so that they provide us all our basic needs and fully supports us. There is a valid, rational and compelling reason for doing so. For, if only we provide for ourselves all the necessities from these areas of habitation, then and only then, will we feel that there is no need for humans to encroach and lay to waste all other natural ecosystems. It will result in true Earth Care.

The decisive area of activity in our settlements, Permaculture believes, is to re-construct and re-generate our agriculture, which happens to be a very important part of the one and only one primary producer, viz. the Plant Kingdom.



No amount of ingenuity, 'science and technology' of humans, can ever replace or substitute any of the natural and life-sustaining processes of the Plant Kingdom. Permaculture aims to allow these processes to operate in our regenerated agricultural systems. Let us not forget that there is no agriculture in Nature. It is a human intervention. Hence, the need to keep our agriculture as near to nature as possible and without trespassing the laws that govern Nature.

## **Applied Permaculture**

What differentiates and distinguishes Permaculture from other systems of agriculture is that it is a *CONSCIOUSLY DESIGNED* systems approach.

Why should we design? The main considerations are:

- \* to conserve our energies in the system (internal);
- \* to cope with energies entering the system (external) like Sun, wind, rain etc.;
- \* to suit climate, site, soils and topography;
- \* so that the systems do not degrade, deplete, pollute or destroy other natural resources;
- \* so that the systems we construct last as long as possible and need least maintenance, and are self-managed;
- \* so that these systems, fuelled by the Sun, should produce not only their own system needs, but also the needs of the people creating or controlling them. Thus they sustain themselves and those who construct them and hence become sustainable systems.

The problem that confronts us, if we are to build systems as above, is that we do not have any HUMAN MADE models to learn from and be guided. At any rate they are sparse and non-existing, thanks to the era of predatory colonialism. This means we are somewhat in the dark as far as human made models are concerned.

However, careful observation of the Natural Ecosystems still existing, especially the Tropical and Temperate Forest systems, can enable us

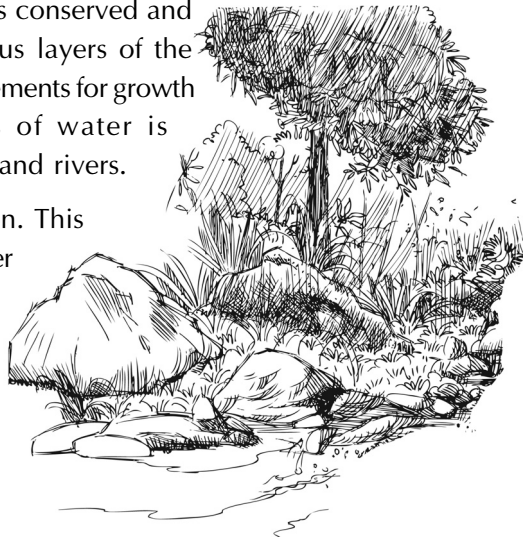
to overcome many of the problems. The feature of these forest systems is that they have remained highly productive of biomass; have existed for millions of years; are very resilient; and above all have been self-managed systems without any interference by humans. This could be the one place where we can look for all information resources while designing our areas of settlement and habitation. In addition we can draw on the traditional wisdom of such societies that have survived without degrading the natural resources on which their life depends.

Permaculture is based on the observation of the working of Natural Ecosystems reinforced by traditional wisdom.

### **A look at Natural Forest Systems**

The one thing that strikes us is these are SELF-MANAGED. The following are some observations:

1. Many species of plants and animals are always found together. Mixed crops and mixed farming is the rule. There is NO MONOCULTURE anywhere in the forests.
2. One rarely comes across bare and exposed soil. Something always clothes the ground, either living plants or dead and fallen litter.
3. All the heavy rainfall is conserved and impounded into various layers of the soil. After all the requirements for growth are met, the excess of water is transferred to streams and rivers.
4. There is no soil erosion. This is seen by the clear water of the streams and rivers.
5. The forest manures itself. All the litter fall of leaves, bark and the accumulation of plant



and animal residues get converted by fungi, bacteria and hordes of micro- and macro-organisms, back into nutrients required for growth.

6. There is no generation of any WASTES. All dead and decaying plant and animal residues are RECYCLED back into the soil.
7. The mineral matter needed for growth is mined by the deep roots of TREES and through their leaf fall etc. added to the soil. A mature tree sheds many times its weight during its life. Trees shield the ground from the impact of rain and the hot sun. Trees conserve and build and aerate the soils. There are no mineral deficiencies and great deal of humus formation takes place continuously.
8. There is always a large fertility reserve in the top layers through the continuous production of humus by the living soil.

Diversity and polyculture, water and soil management, integration of animals, no generation of any wastes, recycling of all animal and plant residues back into the soils, abundance of fertility, long living and self-management; this is the wealth of information resource and the education we receive from the forest systems. All this can be beneficially utilized for the re-generation of our agriculture.

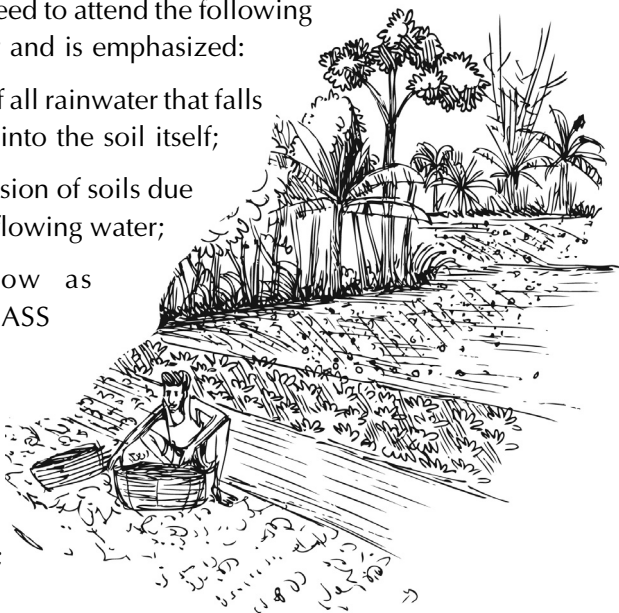
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## *On Designing for Re-generation of Farm Lands*

In Permaculture, information resources as obtained from the observation of the working of Natural Eco-systems constitute the bulk of inputs, whenever designing and re-generating farm lands is undertaken. While doing so, the essential requirement of survival on site, is incorporated as an integral element.

The strategy for all this work is to fulfil the important function to attain as much food security as possible, at local levels. Creation of assets of Natural Resources like water, soils etc. becomes a priority. The immediate need to attend the following functions is clear and is emphasized:

1. Harvesting of all rainwater that falls on the farm, into the soil itself;
2. Arresting erosion of soils due to wind and flowing water;
3. Rapidly grow as much BIOMASS as possible;
4. Recycle all organic wastes to be incorporated into the soils;

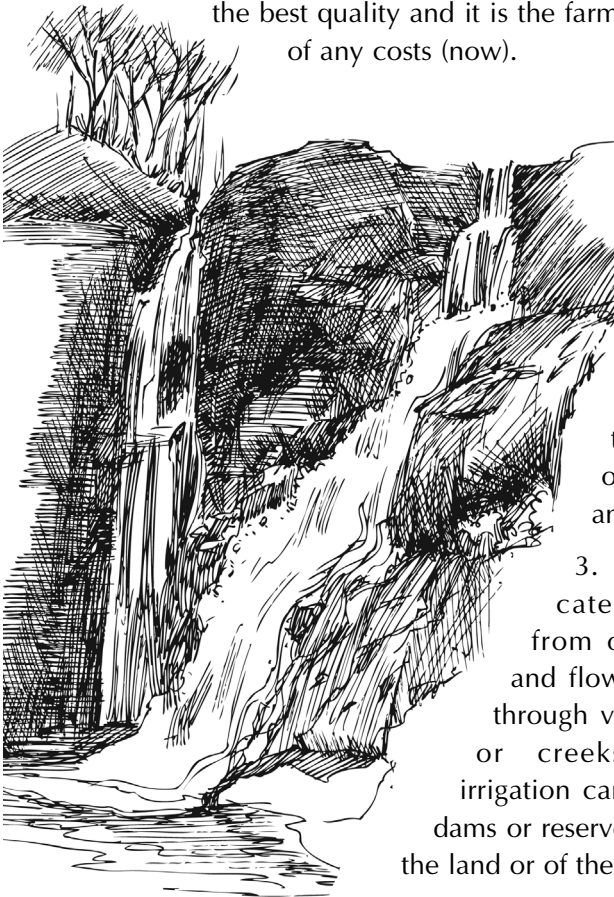


5. Be POLY CULTURAL and increase Bio-diversity to provide increased TOTAL yield and for pest control;
6. Maintain and increase the natural fertility of soil by organic and biological processes and rather than taking recourse to the use of biocides; and
7. Attend to fencing and protection from grazing.

**1. Harvesting of all rain water:** Water is the deciding input for any system of agriculture.

**The 4 categories of water:**

1. Water belonging to the first category and which belongs to the land and the farmer, is the rain which falls directly on it. It is of the best quality and it is the farmer's own and free of any costs (now).



2. The second category is also rain water, but which has filled the land for the time being and starts flowing over and off the land. This also is the farmer's own, of good quality and free of costs.

3. The third category originates from outside the farm and flows on to the farm through valleys, as streams or creeks, or through irrigation canals flowing from dams or reservoirs. This is not of the land or of the farmer. It belongs

to many others and comes both at high costs and with disputes. This is becoming more and more undependable.

4. The fourth category is groundwater occurring in springs, wells and bores etc. With the alarming fall in groundwater tables, this also will be unreliable and costly. The quality of this water is unpredictable.

### **There is no other water.**

We will take the first two categories since they are going to be the only ones that will be dependable in the future, despite the erraticity due to natural and other causes.

The function envisaged in Permaculture is to harvest all this rain water into the soil itself and create storages on the farm for the second category and do not allow any water to flow out of the farm.

This can be achieved by undertaking various Earthworks like contour trenches/ bunds, swales, pits, gully plugs, farm ponds etc. This is the first function we undertake. For dryland farming in semi-arid and arid zones this total rain water harvesting is very crucial and will decide the fate of the fertility of soils and their productive potential.

**2. Arresting erosion of soils due to wind and flowing water:** Three things on this planet are never got back when once lost: Time, Life and Soils.

It is indeed a fact which is easily observed that fertile soils – soils teeming with soil-biotic-life and a great amount of incorporated organic matter seldom gets eroded. However, today most of our soils are degraded and have become less fertile and hence more prone for erosion. Our problem lies here in a two-fold responsibility of first arresting the physical erosion levels and embarking on strategies for increasing the natural fertility of soils. Merely arresting physical erosion will not solve the problems confronting us today.

However, we have to conserve soils from being physically eroded by a) slowing down the speed and volume of flowing rain water by appropriate earth works which will allow flowing water to stay for longer intervals of time at various places to permit percolation into deeper layers of the land; and b) by breaking the force of strong



winds by erecting structures like mounds etc. by living hedges plants, wind break of trees etc. Even a single tree with a good canopy acts as an efficient wind break. Such trees can again be economically useful species. A well designed multi-layer wind break of trees can be established providing multiple other benefits than merely breaking the force of strong winds. They can provide fuel, enormous amount of leaf-fall, and wild fruits, and if leguminous species are interspersed free nitrogen fixation comes as a bonus. Bird attractant species of wild fruit bring in a certain amount of pest control by the birds in addition to their droppings which are valuable nutrients to the soil. Also the birds bring seeds of different species adding to the diversity of plant life.

**3. Rapidly grow as much BIOMASS:** Apart from wind break and fence areas, there will always be small pockets or areas which do not form part of basic food production. These areas should be utilized to grow fast growing shrubs, creepers, TREES, and even weeds in order to increase the production of Biomass, primarily for regenerating soils. The root systems aerate and loosen the soils, the leaf fall can be incorporated into the soils and provide mulch for bare areas. By choosing DECIDUOUS species the amount of biomass can be increased considerably. This rapidly generated biomass should be incorporated into the soils to increase its water holding capacity; to provide food and habitats for the myriads of living organisms of the soil enabling their proliferation and beneficial activity to gradually build up the fertility of soil.

**4. Recycle all organic wastes back into the soils:** By far, of all our activities for regeneration of soils and to maintain the fertility of soils, the recycling of all organic wastes back into the soil, plays a decisive contribution. There is much more in this activity than what appears.

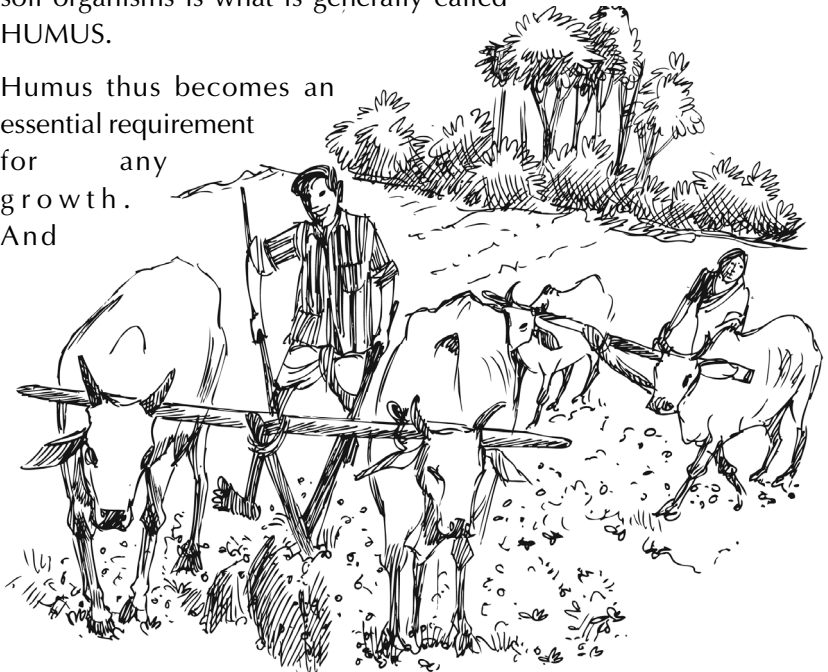
The wheel of life is made up of two processes-growth and decay. They are co-existing, inseparable, and one the counter part of the other. All growth has to die and decay. Nothing grows forever.

However, all growth consumes a nutritive base producing waste products of death and decay. Unless these products of decay are brought back into the nutritive base there cannot be any growth and

the circle of the wheel of life will not be closed or completed. Nature closes this circle through a magnificent biological process which must be allowed to operate in all our soils. Otherwise the balance between growth and decay cannot be sustained.

The energy for any growth is derived from the Sun. The chlorophyll or the green pigment of leaves is the only available mechanism by which the energy for growth is made available. The efficiency of the green leaf is of decisive importance. However, the green leaf needs raw materials from the soil transported through the contact of the roots with the soil. These raw materials have to be present in all soils in available or assimilable forms to be taken up by the roots. These raw materials are the resultant products of conversion of all organic wastes by the activities of fungi, bacteria, and myriads of micro- and macro-organisms that abound in all good soils. For this conversion to be efficient, all the living organisms of the soil need energy or food to carry on their activities. This energy is derived from the presence of organic wastes, the dead remains of all things that had once life. The product of this conversion of organic wastes by the soil organisms is what is generally called HUMUS.

Humus thus becomes an essential requirement for any growth. And



this conversion of all organic wastes through the biological processes by the soil organism should be maintained as a continuous process on all our soils.

It follows, therefore, that the fertility reserves of the soil are maintained and increased. Not paying attention to this recycling process will be squandering the resources and what will result is not good agriculture.

It is to be borne in mind that not all things can be recycled into and through the soil. As a general rule we can say that only those that are products of growth and decay – that is the products of living biological processes – can be recycled by the organisms of the soil. Hence we need to ponder over what kind of wastes we are now generating and littering the earth and how injurious they are to the balance between growth and decay.

**5. BE POLY CULTURAL and increase the bio-diversity to provide increased TOTAL yield and for pest control:** When we come to yields, we are faced with many a problem. It is conceded that for unit area a monoculture will give greater yields.

However, though diverse are our needs and diverse should be the production from our farms, there are some other very important ecological considerations.

Let us take the ecological principle of diversity and 'pest control'. What has been occurring in the forests for millions of years in Nature's inimitable ways, has of late been confirmed by needless experimentation by 'scientists' at great cost of energy - that fluctuations in populations from mild to 'pest-like' proportions, depend heavily on the number of species in an ecosystem and the degree of variety in the environment. The greater the variety of prey and predators, the more stable the population; the more diversified the environment in flora and fauna the less likely is there to be ecological instability. If the environment is simplified and variety of fauna and flora species is reduced, there are greater chances of population fluctuations tending to get out of control reaching pest proportions. In the case of pest control we can avoid the use of toxic chemicals and biocides by allowing for a greater interplay between living things and various

biological processes.

'Variety is spice of life', so it has been said. How do we apply it on our farms, which should be designed as cultivated ecosystems, mimicking natural ecosystems?

The TOTAL yield of diversity will certainly be much more and varied and if some fail, many will not. This adds to the food security.

***6. Maintain and increase the natural fertility of soils by organic and biological processes, rather than take resource to the use of toxic chemicals and biocides:***

"Can mankind regulate its affairs, so that its chief possession – the fertility of the soil – is preserved? On the answer to this question the future of civilization depends."

***Albert Howard, 1940***

That continuation of civilization is threatened, very few doubt. That the answer to the above question has not yet been given is the tragedy of the times.

It should not be a matter of surprise that for a good ride by vested interests that agricultural yield can be liberal usage of inorganic

we have been taken aided by 'science' increased by chemicals.



It is true that the use of inorganic chemicals acts as powerful stimulants and gives an increased yield. But how long can this stimulation be maintained? And at what costs? What are

the field experiences in areas where these inorganics have been used extensively, the areas of the 'Green Revolution'?

Two things are becoming clear. First that the yields have reached a plateau and no amount of extra usage of inorganics is able to increase yields any further. In many areas of the 'Green Revolution' there is being observed a fall in yields. Secondly, the quality of these soils has undergone serious degradation through becoming more prone for erosion, salinity, water-logging etc. - all resulting in decreased yields. It has also been observed that plants/ crops grown with inorganics have lowered resistance for diseases and pest attacks. There also have been observed various subjective effects like loss of taste, flavor and increasing lack of satisfaction and enjoyment of food.

What should shock everyone's conscience is that recent reports say that 30% of the nitrogenous component of ammonium sulphate applied to soils is de-nitrified by soil micro-organisms and escapes into the atmosphere, thereby in the first place not being utilized by plants and in the second place adding to atmospheric pollution. These reports also say that phosphate fertilizers applied to soils do not penetrate more than 2" deep in the soil. That such facts are coming out after decades of literal dumping of mountains of these fertilizers cannot be condoned as an innocent mistake. A cruel and cynical practice has been perpetrated on the farmers. However, someone stood to gain by this.

There are some direct and lethal effects caused by using these inorganics. Nearly 70% components of the 'Big Three' – ammonium sulphate, super phosphate and potassium sulphate, is concentrated sulphuric acid! These suppress, inhibit and kill soil organisms and the day is not far off when our soils get damaged beyond human repair. Another direct effect is that deficiency of trace elements has increased and will reach alarming proportions.

Why then all this? Our present concepts about plants and their growth are fundamentally wrong, and the sooner we re-think and change our understanding, the wiser we will be.

The error starts with our very characterization of soil. It is considered as just mineral, lifeless and inert material; whereas it is teeming with

LIFE. To be brief, one hectare of good soil may contain at least 300 million invertebrates (mites, millipedes, insects, worms and mini creatures). As for micro organisms, a mere 30 grams (6 teaspoonful) of soil will harbor 1 million bacteria; a 100,000 yeast cells; 50,000 bits of fungi; and a few million nematodes; a hundred million moulds etc. In forest lands, every square metre of the top layers of soil can contain over a 1000 species of life forms and one to two kilometres of fungal roots.

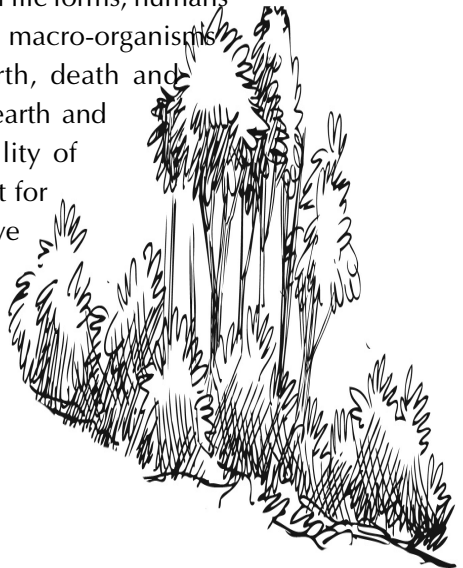
### ***Why is there this teeming life IN SOILS? What role do they play in the soils?***

Here we must have a philosophical approach. Everything is connected to every other thing. For such of those who believe in God, he would not have created this soil life without a purpose. For those who believe in evolution, no life-form ever arises without a purpose.

### ***What then can be the purpose?***

It is now becoming clear that the purpose of this life in soils is to convert all dead, decaying wastes of growth back into the nutritional resource base for continuation of survival of all life forms; humans not excluded. The micro- and macro-organisms through their life cycle of birth, death and rebirth create the soils of the earth and ensure conditions for the fertility of soils for continued survival. But for the microbe, perhaps life as we know as, would have been long extinct.

Look to the forests again. Where are those inorganic fertilizers – NPK? How to account for the gigantic production of BIOMASS over millions of years?



Fertility of soils and its continuation on a long term basis for all generations yet to come, can only rest on nurturing the life in the soils and providing habitats and their energy needs through recycling of all organic wastes. This means that fertility is a function of organic materials and not inorganics. Hence, the need to grow more and more biomass.

Conventional agriculture feeds the crop, Permaculture feeds the soil.

**7.Attend to fencing and protection from grazing:** There is a very old Tamil saying: “The health of a farmer is the strength of his field fence”.

No farm is worth the management and maintenance, which does not have an efficient protecting fence.

In Permaculture, we always think of living fence and by making it multifunctional, many beneficial effects can be obtained. Choice of species is dependent on site specific and local conditions. Some considerations for choice are:

- \* thorny, if needed;
- \* non-browsable;
- \* non-shading especially on the Eastern side in order to allow maximum harvesting of sunlight;
- \* fast growing;
- \* non-invasive, and no maintenance;
- \* provide habitat for diverse species thereby increasing the diversity of the farm;
- \* provide a habitat for birds, and small wild life useful for pest control and occasionally for some food; and
- \* provide some economically useful products.

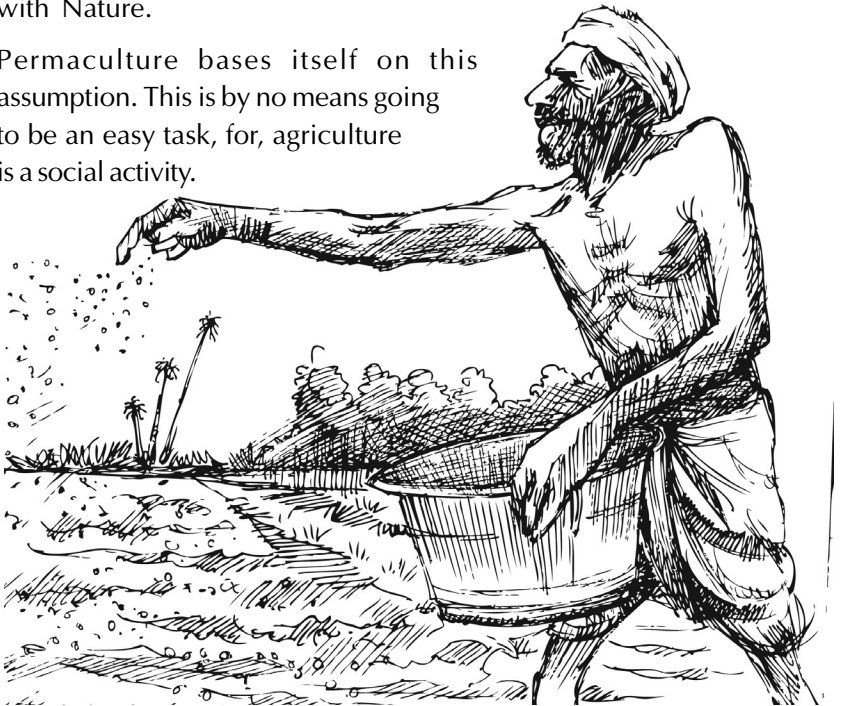
Another benefit of a living fence is that it can function as a wind break and assist in changing the micro-climate of the farm.

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## *New Roots for the Agriculture of the Future - from a Permaculture point of view*

It is being recognized that capital intensive high-tech agriculture is an ecologically unstable system. It is an unstable relationship to nature and is rapidly running out its course. It has to be replaced by a radically different system of production based on a stable relationship with Nature.

Permaculture bases itself on this assumption. This is by no means going to be an easy task, for, agriculture is a social activity.





Innumerable are the connections and relationships involved in any social activity.

However, one of our main trouble is that we over simplify our problems and misidentify their roots. Often the proposed solutions that generally gush forth do not appear to be matched with the subtle intricacies and complex nature of the problems.

We think we know everything. Do we? At a time when we refuse to think of the long-term effects of some of our actions, to assume that we know everything is the first of the oversimplifications that beset us.

What is the problem in the first place? If we undertake a mental survey of the agriculture problem over time and space, and think about the prophesies, passion and eloquence bestowed on agriculture, we are compelled to acknowledge the double bind which confronts us today.

Without agriculture there will be immediate starvation, but with modern agriculture there will be the continued eroding away of the productive bases of human livelihood. This is the problem.

We have assumed a huge role in food production. This is undercutting Nature's potentials because we are taking more from her than what can be provided on a sustainable basis.

Though human memory is notoriously short, it is undeniable that in the long evolutionary history of the human species, nature did take good care of us for millions of years. Cannot we look to her again for some clues, some standards against which we can evaluate and judge our agricultural practices?

If we do so, it is more likely that we can get involved in more harmonious agricultural practices and fewer patterns of destruction. The new roots for the agriculture of the future have to be less human dependent, more self-renewing and self-generating, based on the principles of the workings of nature.

Protracted and thoughtful observation of the workings of nature should be our knowledge system. What the agriculture of the future needs is

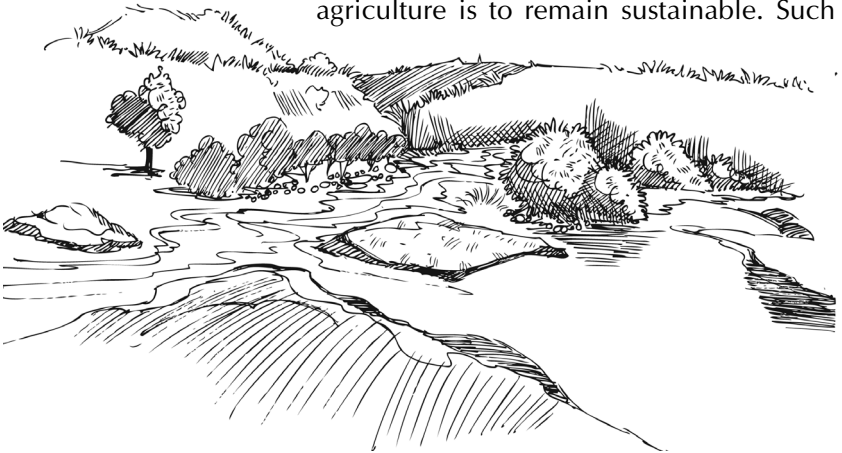
an exploration and discoveries of clues in Nature rather than our attempts to impose on her our inventions and manipulations.

To work with nature will indeed be abstract unless we study the living systems that abound in her. The new agriculture has to be understood and acted upon as a living system belonging to the realm of physiology and biology rather than falling a prey to the realm of engineering and chemistry.

Since agriculture is of recent origin in history, and is not something unchanging and unchangeable, my preference for emphasis will be on changes that could be brought, about changes which will benefit the land and the people inhabiting it.

Agriculture alters more of the environment than just the land that is farmed. It can change the face of the land. Therefore, it should be integrated with an overall and ecological perception for all land use. Changes in land use result in profound changes in the relationships of water, soils, air, temperature both above and within soils. These changed relationships influence the plant and animal populations and their health.

There are broadly two categories of land when land use is taken into consideration. The first is the land that is not cultivated at all. These are the forests, wetlands, mangroves etc. They play a very important role in the economy of nature. Their existence and beneficial influence provide many natural resources which are of vital importance if agriculture is to remain sustainable. Such



areas are the lungs for agriculture. They have to be protected, preserved and nurtured. We need not have to encroach on them and change the land use patterns prevailing there. This would be possible, if we plan, design and evolve land use patterns in our areas of agriculture in such a manner that our areas of occupation provide all our needs. Since our needs are diverse and varied our land uses have to be necessarily diverse. Mixed land use pattern is the assurer. Such patterns:

1. Provide for buffers against unknown and unexpected factors;
2. Slow down the spread of diseases and pests;
3. Arrest erosion of soils due to winds and flowing water;
4. Increase the moisture retaining capacity of soils; and
5. Preserve and increase the fertility of soils.

Mixed patterns have a greater potential for maximizing the harvesting of solar energy by generating greater biomass due to the presence of diverse varieties of the plant kingdom. The greater the harvest of solar energy the greater will be the productivity and this can be designed for our needs.

A mosaic pattern of land use should be established and maintained on our farms. This can be done by combining various:

- \* Annual crops, like cereals, pulses, oilseeds;
- \* Vegetable and herbs;
- \* Needed perennials;
- \* Orchard species; and
- \* TREES.

A greater diversification of crops should be undertaken by retaining local and traditional varieties which have proved stable in our past experience.

Farming techniques should include:

- \* Mixed Cropping;
- \* Crop rotation;
- \* Recycling of crop residues and all wastes through composting, mulching etc.; and

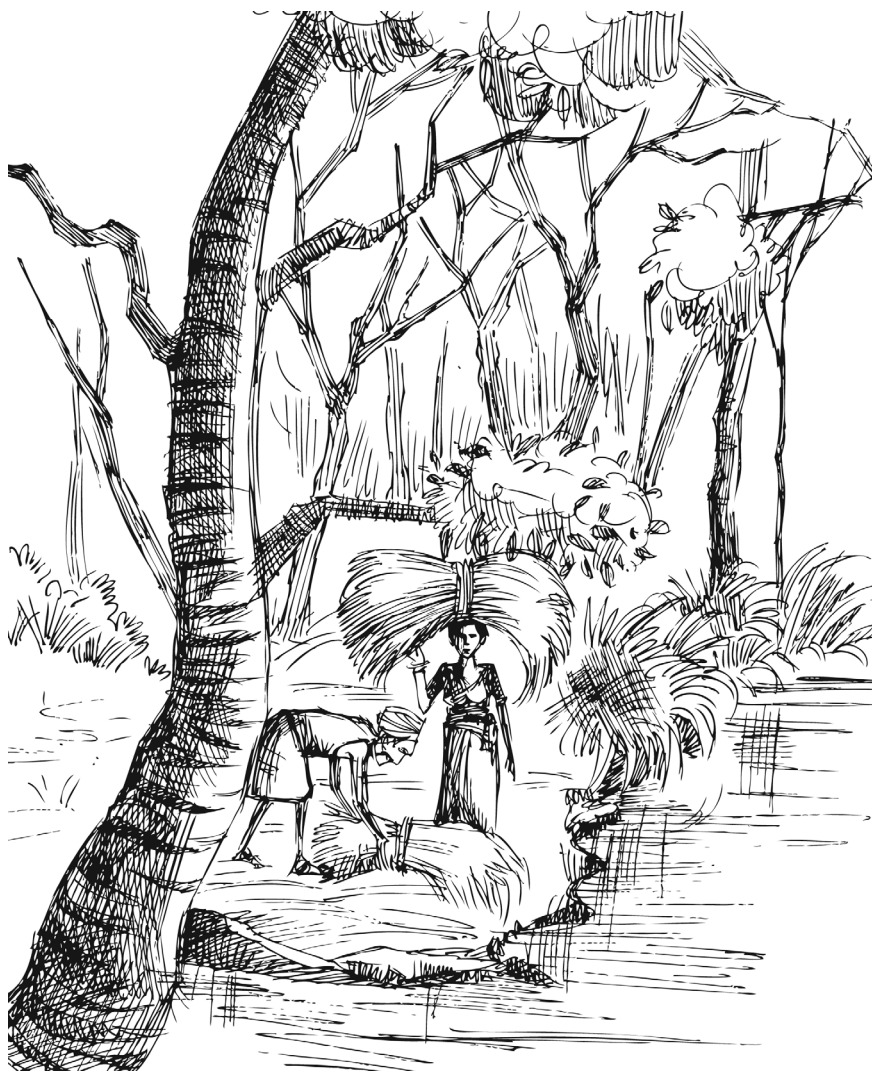
- \* Growing green manure crops primarily for re-incorporation into soils as organic matter.

The pest control system has to be an integrated internal system within each farm. This can be achieved by providing the needs for natural predators and parasites. Spiders, beetles, ants, lizards, frogs, wasps, bees etc, have all got a beneficial role in pest and disease control. Many of them have to be provided with habitats on the farms. Birds and bats too have to be provided refuges and nesting places. The pest control system should be based on a community of all such invertebrates, vertebrates and even micro-organisms. The main aim is to attract natural predators.

The importance of encouraging the proliferation of life within the soil, of micro- and macro-organisms, is the crucial factor for maintaining and increasing the fertility of soils.

Such a system does not trust to any miracle or magic bullet – chemical or biological – but is based on understanding agriculture as a biological community of plants and animal life.





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## *On Soils*

**S**oils and the maintenance of their fertility will decide the fate of civilization. It has been so in past history.

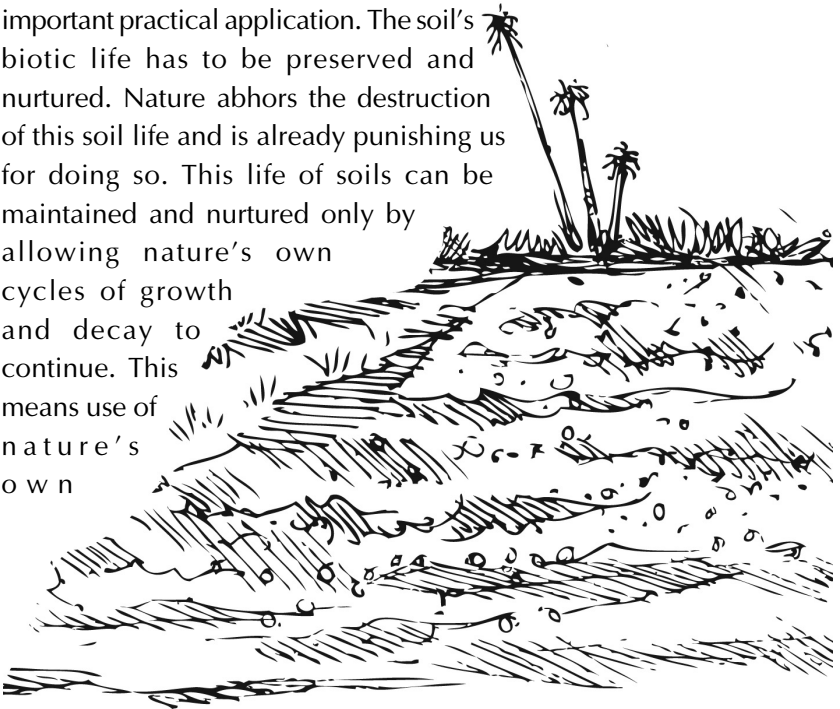
Some basic concepts have to be borne in mind when we have to deal with soils. First and foremost is to consider it as a living biological ecosystem by itself, ever changing (and capable of changing by our efforts), dynamic and teeming with micro- and macro-organisms. It is the life, work, death and rebirth of these organisms that give fertility to soils. But for these, soils will be useless. This concept has a very

important practical application. The soil's biotic life has to be preserved and nurtured. Nature abhors the destruction of this soil life and is already punishing us for doing so. This life of soils can be maintained and nurtured only by

allowing nature's own cycles of growth and decay to

continue. This means use of

nature's  
own



products and not man-made artificials. It means use of organics only.

## **Fertility of Soil**

All human thought and action has to be connected to and invested in this endeavour.

Soil is the primary raw material of all and any agricultural activities. Its fertility and productiveness depends on many factors. The principal factors that determine the nature of soils are:

- (1) The minerals;
- (2) Prevailing climate; and
- (3) Soil's biota,

Of these (1) is predetermined and not readily altered; (2) is likewise fixed and not capable of control; (3) is capable of control; (3) is a living biological process.

While the climatic background is more or less fixed and incapable of change, the effects of the prevailing general climate are capable of beneficial control (1) has on the climate within soils, is available for great and beneficial changes within soils. We are given a chance to make or grow soil.

Soil has a climate of its own. Changes in the climate within soils have critical and crucial function in the improvement of the fertility of soils or its impoverishment.

Of the various elements of climate – heat and cold, wind, water (rainfall, rivers, lakes, streams etc) – the factor of water is capable of great control. We have here to assess potentials of water and understand its physical and biological properties.

## **Life within soils**

What confronts us as phenomena has to be properly understood. At the very outset, we have to understand that all elements of phenomena are inter-connected and inter-dependent and no element exists by and for itself. There is a constant interaction of all elements resulting

in ever changing relationships and effects. Change is the fundamental characteristic of all phenomena.

The second and more important characteristic of all phenomena (terrestrial) is that the interaction of its elements has given rise to the evolution of LIFE in multi-dimensional forms. This life evolving process is a characteristic and unique feature that exists on this Earth. Supporting and nurturing this process of life-evolution becomes the central task and destiny of humans. All human activity has to be based on supporting life in all its forms and not its destruction.

No matter the nature and place wherein human activity takes place, the provision of all means for the sustenance of life forms has to be the guideline of all human conduct.

Observation of (our) solar system brings a striking aspect of the phenomena as an inescapable reality. It is that only on our planet Earth, life in various forms exists.

This presence of life forms is the unfolding of a very long process in the history of our Earth. What is of great importance for us to understand this process is that we humans are a product of this very process and





not independent of it. Such an understanding should make us realize two things:

- 1) We cannot have any existence outside this process; and
- 2) We do not have a superior privileged position in this process.

Now we can sum up at this stage. The characteristic and differentiating feature of the terrestrial phenomena that confronts us is the existence of life in various forms and the human form as one of them. From this observation we can draw a code of conduct for us - it is to support life and sustain it and never otherwise. All our thought and action has to be based on supporting life on this planet.

What we are doing is a different matter and hence all the problems confronting human kind.

We are a part of this whole process, and no part of a whole can ever have a superior or privileged position. All parts have a complementary relationship with each other.

Not to form visions that break radically with the present is to deny a future that can be qualitatively different from the present. It is an abdication of the promise of society to advance into a more humanistic world.

The most minimum content of our visions can only be the recovery of an ecological relationship with the biosphere. Dictates of nature themselves compel us to do so. This is the inescapable conditionality for continuation of all life forms on this planet.

While we seek a unity with nature, equally significantly we must review and recast our relationship to other in solidarity and love that ends all hierarchical and domineering relationships in our species.

Never in the past has it been so necessary to have utmost clarity, and purposefulness that is required in our era. In a society that has made survival, adaptation and coexistence a mode by domination and annihilation of all life forms, there can be no compromises with contradictions – only their total resolution in a new ecological society of our visions or else the inevitability of surrender and maintenance of the status quo.

We need not be pessimistic. Change is inevitable – present is unstable.

When we understand that all living things are dependent on the world external to their bodies, for the sustenance of their lives, a relationship between life forms and the external world (nature) exists.

In philosophical terms let us consider life forms as the subject and Nature as the object. Here, the self needs of subject are entirely dependent and derived from the object. If the derivation of the self needs of the subject is exclusively for itself without any regard to the integrity of the object, the inevitable result will be the depletion of the capacity of the object to provide sustenance needs for the subject. Such a relationship will be one of appropriating the object and the result will be a disharmony between subject and object. On the other hand if the self needs of the subject are defined in terms of mutual support, then the relationship between the subject and object become one of a complimentary nature, a relationship of mutual interdependence.

By this complimentary relationship, a unity between subject and object is forged resulting in harmony between them.

Unless and until we have this harmony between society and nature, the fundament of evolution itself will be endangered.



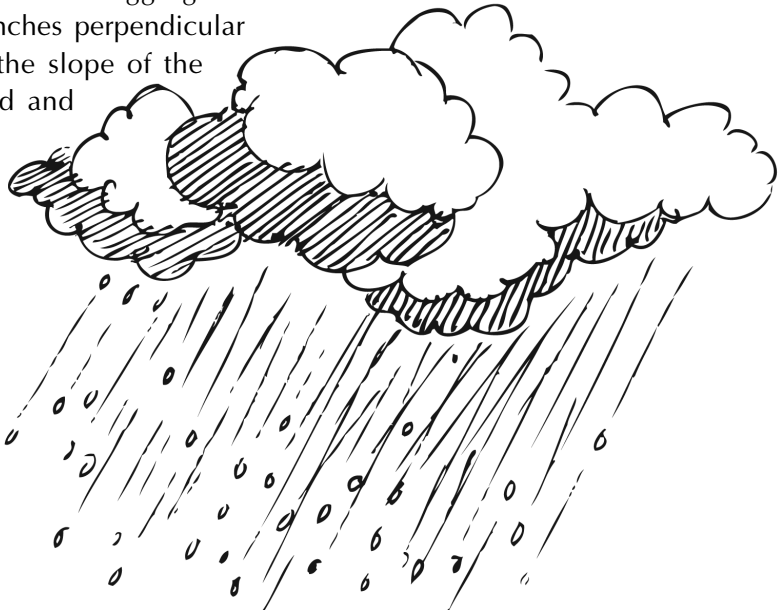


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## *On Water*

**W**ater being a crucial natural resource, harvesting all rain water into the soils of our farms assures great importance. How to go about this task as applied to our farmlands? Every drop of rain has to be harvested. This can be done by observing the action of gravity and the physical properties of water. Since water finds its level, we have to deal with levels. We have to consider contours. Only then we will be able to arrest the flow of water and gather it at contours and hold it there as long as possible so that it percolates into the soils to various depths. Water thus harvested and stored in soils will be available for plant growth – annual crops, trees, shrubs etc.

Therefore digging of contour trenches perpendicular to the slope of the land and



constructing bunds on contours, downstream of the trenches is the first of the earth works that have to be undertaken on each and every farm. It is essential that the bunds must be seeded and planted to give them a protective living green cover so that erosion of bunds do not occur. Bunds can be consolidated and stabilized on a permanent basis. Maintenance against erosion will then be very minimal.

Some practical problems will arise. What should be the distance between bunds, considering the need of small farm holdings to raise their annual crops and the necessity to till, plough, and the bullocks and plough share to make turns etc? A distance of 50 to 60 feet between bunds may be tried out.

It should be remembered that trenches and bunds are not to be attempted for every contour of the farmlands. Even one or two, even one critical contour trench and bunds per farm will suffice, and this will very remarkably alter the productivity of the holding. All ploughing should again be on contour.

Farmers raise an objection that the area under trenches and bunds are "lost". This need not be so, since the bunds can be planted with vegetables, grasses for fodder or green manure species which can be cut to be incorporated into soils.

A very important procedure in all earth works and excavations (for rainwater harvesting) is to keep aside the first 6" of top soil separately and put it back on top of the bunds rather than burying it underneath over deeper layers of excavated soil. This is more or less mandatory.

Next to contour trench of bunds, all gullies have to be plugged immediately. So too, rills should be attended to. Today's rills are tomorrow's gullies. Today's gullies are tomorrow's ravines.

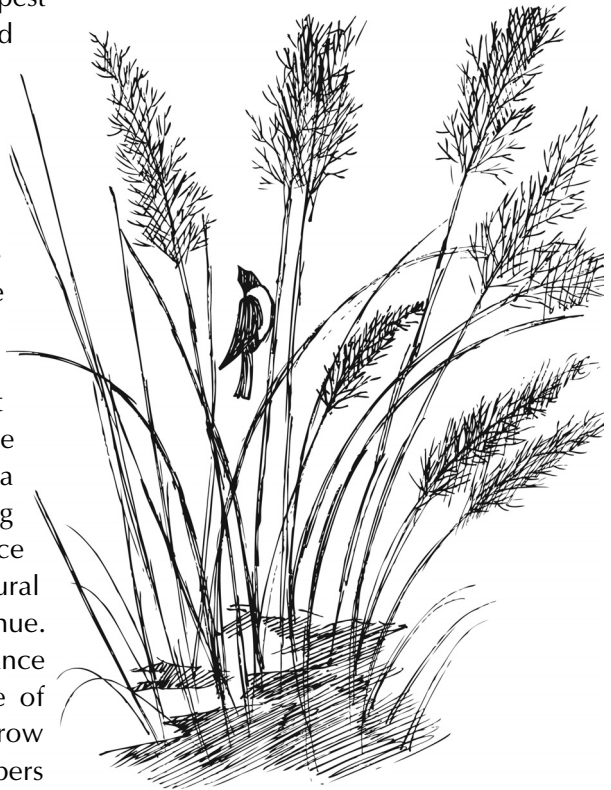
Incidentally, you will find such of these earth works, apart from harvesting water also arrest sheet erosion of top soils due to flowing water.

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## *On Pests*

Nature is highly complex and any intervention in this diverse network is likely to have many indirect and unexpected consequences, some of which negate the original purpose of the intervention. The one problem-one solution approach just does not work.

Understanding the pest problem should begin with the examination of the whole ecosystem in its diversity, complexity and change. What we call 'pests' are organisms of natural evolution. Hence they are part of nature. In nature there is always a balance of all living things. This balance is necessary for natural evolution to continue. Whenever the balance is disturbed some of these organisms grow in enormous numbers



and assume pest proportions causing great damage to yields, and life. So, we have to investigate what factors led to the imbalance. Without first doing this and rectifying, to go in for elimination of so-called pests by whatever means – chemical or organic – will be irrational. We may not succeed either. By going in only for elimination we are dealing with the product or symptom rather than the cause.

By doing so we deal only with symptoms and not the CAUSES. The imbalance may be the result of:

- \* Decreasing fertility of soils;
- \* Growing crops in unsuitable areas;
- \* Monocultures;
- \* No rotation of crops;
- \* No return of organic wastes;
- \* Moisture stress;
- \* Excessive tilling and ploughing;
- \* No aeration of soils, water logging etc.;
- \* Agricultural practices resulting in top soil erosion and that do not grow soil; and
- \* High N fertilizers, herbicides making plants more attractive to pests.

The first result of imbalance is loss of natural predators. So the first thing to ensure is to maintain the population of natural predators by providing them with habitats as well as their food. Above the soil these natural predators can be beneficial insects, birds, bats etc. The commonality of all these is that they are natural predators. As a community all of them play their part in contributing to the balance in nature. No single species is thereby allowed to increase its population to damaging 'pest' proportions. Hence the first step to undertake in our efforts to pest control is to ensure the presence of these natural predators.

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## On Trees

There is a Tamil saying:

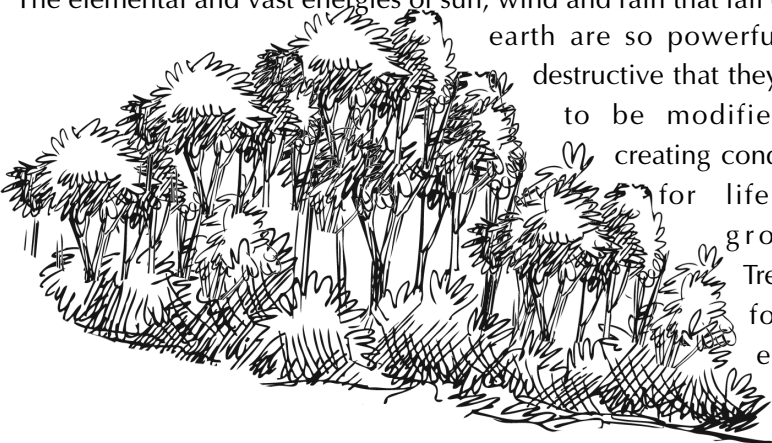
*“Manidhan indri marangal irrukkum.  
Marangal indri manidhan illai.”*

*“Without man, trees can exist  
Without trees, man cannot exist.”*

Despite all our claims to any higher intelligence and our arrogance of our so called achievements, we should feel humbled to accept the truth that at the beginning and in the end we are just plants.

The capitalist, communist and developing worlds will be equally leveled down by forest loss. Those political, economic and religious ideologies which fail to care for forests carry within them the lethal seeds for their own destruction.

The elemental and vast energies of sun, wind and rain that fall on the earth are so powerful and destructive that they have to be modified for creating conditions for life and growth. Trees are for the earth





the only and ultimate moderators of these elemental incoming energies. Recall the 'seminon' of the gods regarding sending down ganga to the earth

We do not know the totality of the beneficial functions of trees. Trees constitute a living system by themselves. Our knowledge of life and living systems is at a woefully low level even though we have succeeded in putting a man on the moon and take pride in our knowledge of distant life-less planets, stars and galaxies of the universe. However, despite this little knowledge of living systems the fact remains that without trees we cannot inhabit this earth.

The modifying influences of trees on all the incoming energies, have to be continuous process of study, observation, assimilation of facts and effects and application in all our life activities. Solar energy and all its renewable derivatives are our only sustainable and harmless sources of energy for sustenance of life in all its forms. *Forestry and Agriculture are our primary and only self-supporting systems of harvesting this solar energy.* No technological development or inventions will ever change this basic fact and truth.

The interaction of plant life in general and trees in particular, in maintaining the life-supporting composition of the gases of the atmosphere are fairly well known. So too the moderating influence on temperature. More so the provision of food, fuel, fodder, timber etc.

However the role of trees and vegetation in general in the building and conservation of soils; and the role of trees in recycling water back to the atmosphere for the birth of moisture bearing clouds to shed more rain in inland and arid regions are two important roles which need more of our attention.

If trees are so decisively important, we should understand what a tree does for us. For this we have to understand the tree itself, its life and functions.

## The Biomass of the tree

The tree, broadly speaking, consists of many zones. We can classify them as:

**Zone 1** *The visible tree* – The stem/ trunk and crown/ canopy. The visible tree is 40% to 60% of the mass of the tree.

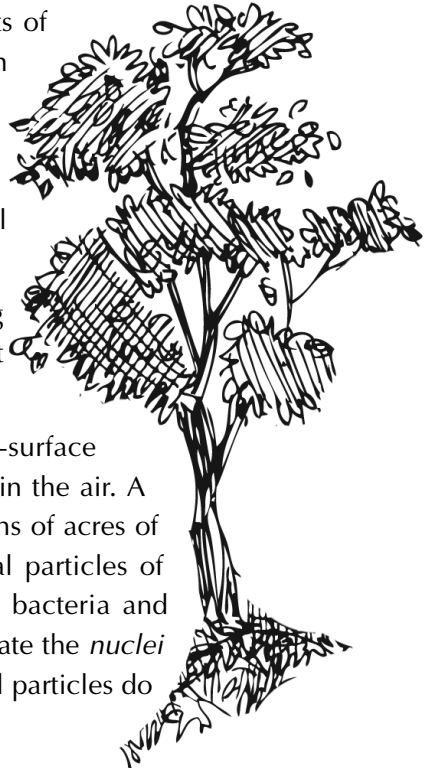
**Zone 2** *The tree at the soil surface boundary* - This is the litter and humus layer consisting of shed leaves, dead parts of the visible tree like bark, seeds, decaying fruit and fallen flowers. It also consists of the dead remains of the inhabitants of the canopy, like birds, insects, worms as well as a lot of their droppings. It has great numbers of living and dead micro- and macro-organisms.

In the first half metre depth, nearly 85% of the roots of the tree are found. 90% of the total mass of this layer consists of water. This is the *Zone where most of the decomposition takes place.*

**Zone 3** *The invisible tree* - consists of the root system and its associates. In the deeper layers lies 15% of the trees root system in association with soil particles surrounded by air and thin films of water, fungal hyphae etc.

Like all living things, the tree during its life time sheds many times its *weight* to the earth and air.

It provides a very large cool leaf-surface area for *condensation* of moisture in the air. A single large tree can have a few tens of acres of leaf surface area. It provides aerial particles of pollen, leaf dust and microscopic bacteria and the organic particles, which all create the *nuclei* for rain drops. Urban and industrial particles do not provide such nuclei.



Trees act as barriers to the flow of winds and compress the air thereby increasing the moisture content per unit volume of air.

All these functions can be utilized to build our soils and increase moisture harvesting for beneficial use. However, we have to understand how trees can enable us to access more moisture and rain.

### ***How the Tree Interacts with Rain?***

During rain, many tons of rain water will impact on the earth even in a single hour. On bare and exposed ground the soil particles will be loosened and carried away by surface flow. Hundreds of tons of soil are thus lost. When soils are bare we lose them.

Tree canopies intercept the falling rain and protect the ground underneath from being eroded. When it rains lightly, little of it penetrates beyond the canopy. Most of it spreads as a thin film of water across the leaves and branches. The cells of tree absorb a large amount of this water and the rest in the presence of circulating air is EVAPORATED back to the atmosphere. If it rains heavily there is further absorption by the visible tree. So much

so after heavy rains the visible tree is nothing but a mass of 90% water. The excess



rain slowly drips down and enters the humus layer.

This water that enters the humus layer is no longer rainwater. It contains bird and insect droppings, dead remains of insects, many plant cells, dust, debris, dissolved salts of the tree, gum and other exudates of the tree, and thus contains a high proportion of organic content. Rain water has become a nutrient solution for growth.

What happens at the soil surface level and lower down? At the surface, there are a lot of fallen leaves, branches, bark and vast collection of the droppings and remains of the inhabitants of the canopy. This is the litter layer. It acts like a sponge and becomes an obstruction to the horizontal flow of excess rain water. So much so that no soil loss takes place here. This litter layer in turn absorbs as much water as possible and after that the excess water flows into the humus layer which is partly decomposed organic material of previous seasons. Again absorption of water takes place and excess water infiltrates into deeper layers.

Partly in this humus layer, and below it, upto about half metre or so, lie the bulk of the root system of the tree. 85% of the root system can occupy this area, forming a mat and clothed with fungal growth in intimate associations of exchange of nutrients. The water content of this layer is as high as 90 to 94%. The root mat actively absorbs enormous quantities of this water, transporting to the atmosphere. It is important to bear in mind what is occurring in this layer.

Considering the main function of roots is transport of water to the visible tree and that 85% of the root system of the tree is present in this area which in turn is, made up of 90% of water, *the bulk of transpiration of water by the tree to the atmosphere takes place from this layer.*

The soil particles around the tree are now fully wetted with thin films of water which is available for use by the roots. When once the soil is fully charged - as "Field capacity" is reached - free water at last percolates into the deeper layers and, participates in recharging wells, tanks and other groundwater storages. Over time, place and distance this finally gives birth to springs; streams and rivers and ultimately reaches the seas.

There is one other crucial happening taking place in this humus layer. This layer consists of an accumulation of dead organic wastes both of plant and animal origin. And converting them back into nutrients for the tree, commences in this layer. The enormous numbers of micro and macro organisms, that are teeming in this layer, through their cycles of birth and death, convert all the organic wastes into nutrients and make them available in assimilable forms through the soil solution to the roots of the tree. But for this role of these organisms, nutrient supply for growth would not be possible. Hence our understanding of soils should be one of a LIVING SOIL, rather than some inert or life-less category.

The rest of the roots, roughly 15% of the root system, penetrate up to 40 or 50 metres. This root system mines the deeper layers both for minerals and water and in association with the water, transport the minerals up the tree for use. In this process also considerable water is transpired to the air.

When we look at the tree after heavy rain we observe that the visible tree is nothing but 90% water. The water absorbed and contained in the litter and humus layer is 90% to 95%. Then when we consider the water in the large mass of root material and in the layers of soil on which the tree stands and lives, we find that the tree and its immediate surroundings is nothing but a reservoir of large amounts of water - a water reservoir which is self-managed and water that is being recycled. No other storage system is so much beneficial resulting in so much useful growth.

What is of important relevance for us is this natural recycling system of water by trees. We can summarise this recycling process:

**By TRANSPIRATION** – the release of water through the pores of the tree an unfailling return back to the atmosphere 50% of the rainfall;

**By EVAPORATION** – another 25% of rainfall, the remaining 25% is harvested by the deeper layers of soil for recharge of GROUNDWATER tables and for the birth of springs, streams and rivers.

In other words after rain, trees recycle back to the air 75% of the rainfall and this water can be used to cause further rainfall. This is data which no government can ignore. Yet to them trees and forests

are just timber. However, it is the people (not represented in any government) who have to bear the havoc of drought and floods through loss of tree and forest cover.

It is what we do on sites that will make water a scarce or bountiful resource. It is upto us to examine ways to increase local moisture or rain. We have noticed how trees interact with rain.

To start with, by large scale afforestation on all barren and wastelands, we can commence harvesting of the 25% of the groundwater flow into our wells, tanks and other water storages. We can establish broad shelter belts of trees across the direction of winds.

Trees play an important role in the smooth working of the flow of the hydrological cycle.

Apart from evaporation from water bodies there is the water (moisture) sent up, invisibly sprayed into the sky by vegetation. A single full grown tree can transpire a few thousands of litres in a simple summer day. How much more then, a forest? Moisture bearing clouds can be made this way over the land, without the benefit of seas. These are tree-clouds not ocean clouds. And they have high moisture content. This cloud-feedings by trees cannot be ignored.

All vegetation, be it grasses, scrubs, cultivated annual crops and trees etc. evaporate water. This process is usually understood as evapotranspiration. There is some data that indicate, in terms of maize or corn that for every pound of dry substance produced there is an evaporation of nearly 235 pounds of water! In terms of turnips for every pound of substance produced, 910 pounds of water is sent up into the atmosphere. Under good cultivation an acre can produce 7 tons of dry substance, which on above terms, means



3500 tons of water is thrown up into the atmosphere. If this is true of crops, how much more will it apply to forests. Some well grown and mature trees can each transpire upto 5000 gallons of water in a single summer day!

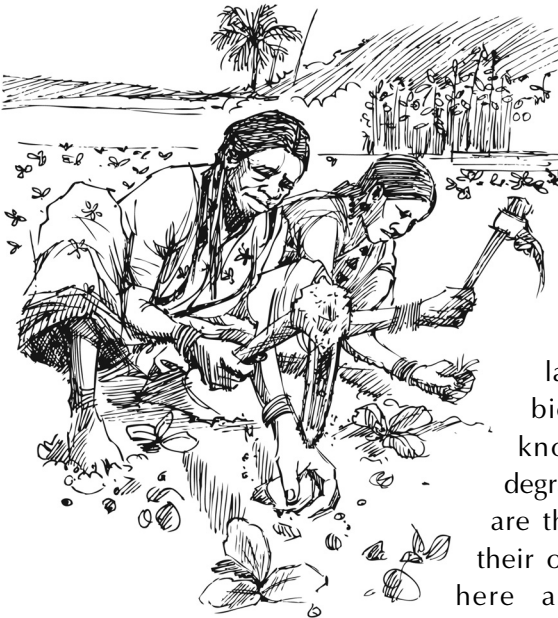
These tree-clouds are important and crucial for inland areas, particularly the large tracts of arid and semi-arid areas of the Indian subcontinent. In our endeavours to live off semi-arid lands, the generation of these moisture bearing tree-clouds must not be underestimated. This can be achieved by afforestation and not by de-forestation.

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## *Dynamics of New Agriculture*

The task of a just, human and environmentally sound farming/agriculture cannot be separated from remaking a just and ecologically balanced society.

No matter what philosophy we subscribe to, what we have to bear in mind when considering any work with small/ marginal farmers in India is to work on a long term basis to evolve systems of production to ensure as much food security as possible from their holdings. The prime consideration is survival on site. Unless food security and survival



are integrated our efforts will fail.

This entails the undertaking of very essential work on a priority basis to lay the foundations for the regeneration of the land holdings consistent with laws that govern living biological systems. We know how eroded, degraded and resource-less are the land holdings and their owners. We start from here and with all these



handicaps. The main direction of our work should be to increase the biological resources on every square metre of these lands. For, only living biological systems can provide for all our needs. This work has to be based on the plant kingdom because that is the only primary producer. If this is so and accepted, then we have to necessarily think of water, soils, air, solar energy and its products. These are the basic bricks.

Nature has her own design and laws. We cannot go against his or her laws. We should never attempt it. We will never succeed. All terrestrial ecosystems are governed by Nature's law of Gravity. The operation of this law tends to degrade and erode the physical, chemical and biological resources and energy potentials of any landscape. Natural ecosystems evolve strategies to overcome these inexorable effects and thereby tend to flourish and provide for the generation of various other biological resources.

When we have to deal with any agricultural system needed for our survival, it is relevant to bear in mind some important facts.

Any agriculture is unnatural. There is no agriculture in Nature. Even if it is 800% organic, it is still unnatural. All types of agriculture are cultivated systems and not natural systems. However, agriculture is needed. Our problem then becomes, how near an approximation to Nature should our agriculture be? If it is to be sustainable, then it should be as near an approximation to Nature and governed by laws that operate in and govern Nature. Therefore if we are able to consciously design our cultivated systems based on laws governing Nature, only then can we construct productive systems for food/ fuel/ fodder. Otherwise, it will result in mining, depleting, polluting and poisoning the natural resources – i.e. our resource base.

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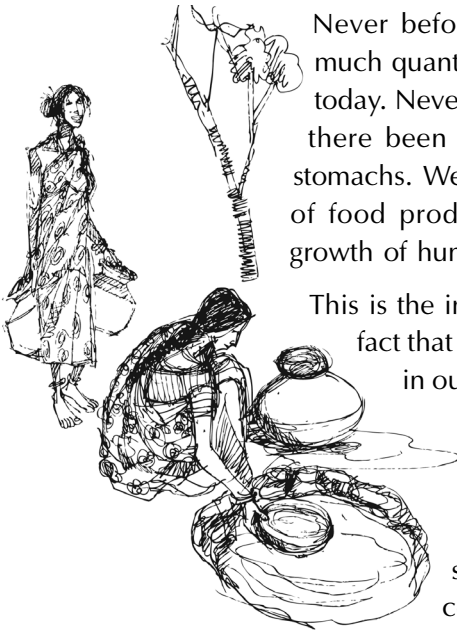
## *The Goal*

**A**griculture to be small-farm based. Landless to get access to land. **INPUTS** (seed, nutrition, water) needed for farming to be **FARM GENERATED** from within the farms.

**OUTPUTS** as **NEEDS** for local and regional self sufficiency rather than for distant markets.

Agriculture (farming) is a **SOCIAL** activity. It's social goal **OUGHT TO BE** elimination of **HUNGER**, not **PROFITS**. Only then, it remains **ETHICAL**.

Agriculture ought to sustain **LIFE** in all its forms.



Never before in human history has so much quantity of food been produced as today. Never before in human history has there been so vast numbers of hungry stomachs. We see rising and rapid growth of food production at one end and the growth of hunger at the other end.

This is the inevitable consequence of the fact that the object of food production in our present society is not meant for human sustenance but is meant for the growth of profits for a few. The present social system needs for its survival this paradox or contradiction to continue.

Only by resolving this contradiction can food production truly become capable for human sustenance. Any transformation of the present food production system requires a radical transformation of society. You cannot have anything human and sustainable in an unstable and inhuman society.

The changes needed are huge and go to the very foundations of the social system. The task of creating a just, humane and environmentally sound food system cannot be separated from the creation of a just and ecologically sound society.

As long as we see Nature as passively absorbing the impacts of our interventions, we will be caught by surprises. Nature reacts, responds.

## **Some Parameters for Evaluation**

### ***Social***

- \* Farmers to have control over the farming operations and the produce;
- \* Generate employment;
- \* Food security.

### ***Biological***

- \* More and nutritious food to eat.

### ***Water management***

- \* Drip irrigation is efficient and relevant adaptation has to be done;
- \* You cannot have rational water management without looking into recharging of aquifers, AND TREES.

### ***Bio-economic***

- \* Increased productivity and increased monetary gains not to be the goal;
- \* How much food security is obtained thro food crops (restrict cash crops to 25%);
- \* Employment generated.

### ***Energy Equation***

- \* Energy outputs more than the inputs.

## VENKAT'S GARDEN

Venkat, founder secretary of the Permaculture Association of India, passed away this afternoon at Secunderabad, Andhra Pradesh. He was eighty nine. Venkat was a guru and mentor to many who took up agriculture on ecological principles. To the very end he practiced permaculture in his little home garden.

The man and his garden had been a source of inspiration for permaculturists for decades. If one had a problem in farming or a query in anything else, he had a fairly good answer to it. Never assertive, he like a good scientist, would tell, what was probably correct.

The Permaculture movement that evolved through the 1970s in Australia was popularised by Bill Mollison and his student David Holmgren. Bill and Venkat were good friends. Venkat in association with Deccan Development Society pioneered Permaculture in India, hosting the first national meeting in 1986. The first experimental Permaculture farm was set up at Zaheerabad, Hyderabad in 1987 under the guidance of Venkat.

Venkat's garden was a source of inspiration to both visitors and friends. Frail, but sharp in intellect, like the true "earth-carer" he was always happy to show you around his home and garden, explaining things along the way. His garden thus doubled as a demonstration plot for the many visitors who dropped by to understand the tenets, principles, practices and philosophy of permanent agriculture. He kept a seed bank of several fruit and vegetable plants that he grew and was happy to gift seeds and saplings to any enthusiast who was keen to start a garden or already had one.

A tour of Venkat's garden instantly shows the fine web of cycle, recycle.

The soil is a wealth of rich dark humus - soft and crumbly to the touch. A handful picked from any part reveals the densest population of healthy earthworms, seldom seen elsewhere, given Secunderabad's hot and dry weather. Fruit trees, vegetable shrubs, vines, medicinal herbs and trees that provide good leaf litter for mulch are all part of the gardenscape.

A few interesting features are the vertical mulch - nothing fancy - but heads of used degradable brooms stuck all around the garden to aerate the soil; vines and creepers that one would normally train on trellises growing vertically on string props; half buried earthen pots and discarded water filters to slowly dispense water during the hot months of water scarcity; birdbaths to attract feathered pest controllers and so on. No visible pests here, only the gentle buzz of bees and the flutter of butterflies.

All biodegradables including the dust collected from indoors is added to the compost heaps that abound with the 'Cinderellas of nature' going about their business in a shady corner of the garden. A discrete board at the gate simply states - Permaculture.

Nyla  
Goa  
25<sup>th</sup> Aug, 2011

## **VENKAT - THE IDEOLOGUE, FARMER, HEALER AND COMFORTER**

Venkat who we never thought was mortal expecting he would be there forever holding our hands and comforting us in sickness and strife. There for us to turn to for advice, information, comfort and love carefully masked by his wry smile and knitted brows. A mine of information. A cynic who carefully avoided giving advice except about plants.

He always loved growing plants and when he was working in a hospital, suturing wounds, giving injections, and testing blood samples he went home and tended the most beautiful collection of roses on his balcony. He made a virtue of bearing pain and refused painkillers and palliatives, returning to his table after a minor surgery. But he was wonderful at easing the pain and creating comfort for all of us who were sick although his wry humour would belie the gentle loving care he lavished on us. He loved good food and good cooking and was so agile with his fingers that he could fix almost anything that was broken. He literally lived as if he had taken a vow of poverty and austerity. I still remember when he worked in the hospital he had dried out his only pair of pants which were stolen and he came running to my father saying 'Give me an old pair of trousers I have to go the hospital!'

He loved children and spent many days at Vidyaranya waiting for his favourite grandchild under a tree while drivers, chowkidars, teachers and children would go to him for advice -health, emotional, financial and gardening. He would carefully collect the goat dung under the trees for manure and clear the grounds of rough stones and glass

pieces so that the children wouldn't get hurt playing. A pocket full of sweets for the kids who came running to him hurt [limbs or feelings] and a packet of *mithai* for the watchmen and drivers every closing and opening day of school.

After he retired from the hospital he spent his time listening to music, reading and gardening at home. He was resigned but not happy. I worked for the Deccan Development Society then and asked him whether he would like to attend the first Permaculture Workshop we were organising with Bill Mollison. Surprisingly he agreed and that was a turning point in his life. It was love at first sight. He adored Bill and drank deep the philosophy of Permaculture. He created the Permaculture farm in Pastapur. For being instrumental in making that contact and opening up worlds of meaning and visions of the future for him I am truly grateful. It was a rebirth from a disillusioned revolutionary and cynical health professional to a world that was connected, where there was hope and meaning, where there was work that was worthwhile. He spread and shared his ideas and his learnings across the country and was instrumental in inspiring many to organic farming and a love of the earth.

He was puritanical and intolerant of dishonesty and wastefulness but generous and warm in sharing his resources. His steadfast spirit, his strength and straightforwardness is something that shines out encouraging us to try just a little harder. The mini forest that was his home he tended scrupulously until a few days before he passed on.

Vasanth Kannabiran  
Secunderabad  
14th March, 2012



Venkat (1923-2011) was a guru and mentor to many who took up agriculture on ecological principles. If one had a problem in farming or a query in anything else, he had a fairly good answer to it. Never assertive, he like a good scientist, would tell, what was probably correct. To the very end he practiced permaculture in his little home garden.

Frail, but sharp in intellect, like the true "earth-carer" he was always happy to show you around his home and garden, explaining things along the way. His garden thus doubled as a demonstration plot for the many visitors who dropped by to understand the tenets, principles, practices and philosophy of permanent agriculture. He kept a seed bank of several fruit and vegetable plants that he grew and was happy to gift seeds and saplings to any enthusiast who was keen to start a garden or already had one.

Other Books by Venkat:

- ❖ On Composting (English and Telugu)
- ❖ Some Reflections on Watershed Development (English out of print, Telugu)

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