

Food, Energy, Life

Life is given to us,
we earn it by giving it.
- Tagore

- Sudheer Reddy

This article is about food, energy and life. Let us start by looking at figure (a). I think most of us are familiar with this life flow. If you wonder how this life flow is sustained then refer to figure (b). You will not find anything exciting but rather boring things such as organic matter, microorganisms, humus and soil-nutrients. However these boring things are extremely important in sustaining the life flow on planet earth. It is interesting to know how we, as a human race, played our role in this life sustenance cycle in the past, what is happening in the present and what our children have to deal with in the future. My focus in this article is on plants.

Figure (a)

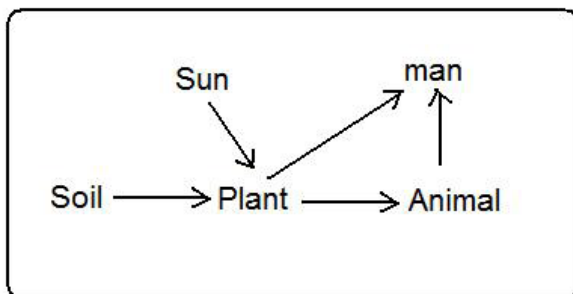
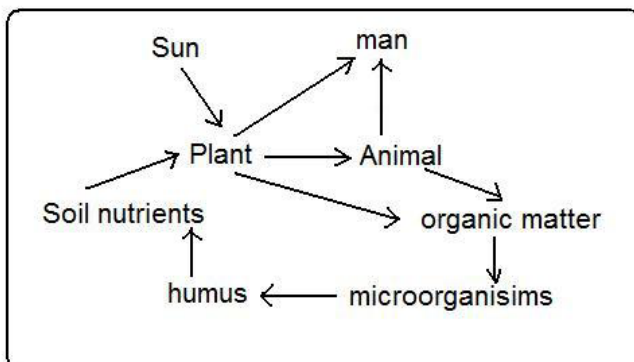


Figure (b)



A little bit of history. Man crossed a very important milestone when he evolved from hunter-gatherer to domesticator of grains. Archaeologists and historians suggest that it all started in the fertile crescent of Middle East around 10,000 years ago. Since then, man clearly understood the life sustenance cycle (figure-b), developed cultures based on making this cycle even more efficient, created a huge knowledge base required to domesticate “selected” plants and basically found the rhythm to live in harmony with nature.

However, as man got smarter (or evolved), he

understood the science of things around him and inside him. Man’s struggle for existence led him to triumph over natural disasters and diseases that had kept his population under check. What is the impact of such “rapid” evolution and population growth on the life sustenance cycle? Until recently man was using natural way of farming plants (or natural-farming) which is in alignment with nature and where entire focus was on making sure that soil nutrients are abundant to support the plants. It was also interesting to note that there was a little bit of tinkering done by adding certain natural materials to the soil (lime and gypsum) to improve the yield of natural-farming.

However, when Justus Von Liebig, one of the most influential chemists of 19th century, published his research on agriculture chemistry, the way of farming entirely changed with focus shifting from soil to plants. All soil nutrients were boiled down to N-P-K: Nitrogen, Phosphorus and Potassium. Slowly over the century most of the countries adapted this new way of farming which relies on synthetic fertilizers as a total diet of inorganic minerals to cater to plant’s needs. This industrial way of farming was primarily aimed at improving yields in order feed growing population.

So we have natural farming - dominant way of farming in the past, and industrial farming - dominant way of farming in the present. Let us look deeper into natural farming.

Natural farming:

Key principles of natural-farming (as I understand) are Living soil, Soil fertility, Natural manures, and Pest & Weeds management.

Living soil is the foundation of natural farming. It is the Soil where life is teeming with creatures such as earth worms, mites, centipedes, lice, worms, termites, ants, and millions of microorganisms. These creatures are essential for breaking down the organic matter and to make nutrients available to plants. Healthy soil = Healthy plants that are naturally disease and pest resistant.

Soil fertility is the basis for sustainability. Attention is given to building Humus which is well-decomposed organic matter in the soil and is produced by a host of beneficial soil organisms.

Humus holds essential nutrients and releases them slowly to the plants, prevents harmful chemicals from damaging plants and helps retain water in the soil. Soil fertility once established can be maintained and improved by crop rotation.

Natural manures such as animal manures and composts help to increase soil fertility. Compost is basically enriched biomass. All the biomass ingredients are usually collected within the farm. It is said that composting is similar to preparing curd at home. Right combination of biomass, culture, temperature, water and air makes the right compost.

When living beings (plants and animals) co-exist sharing natural resources the weak perish and the strong live longer maintaining equilibrium in the eco-system. Pests are treated as integral part of the farm eco-system and are naturally kept under check. One way to deal with Weeds is cutting off or smothering.

If you notice, natural farming is perfectly aligned with life sustenance life depicted in figure (b). Now let us look at industrial farming.

Industrial farming:

Here the focus is to increase crop yields by large scale usage of inorganic salt fertilizers, pesticides, growth stimulants, mono cropping and unsustainable irrigation methods in order to achieve desired results. Recently genetic engineering is applied to directly manipulate plant's genes. Are there any undesired results of industrial farming? Yes, vanishing top soil fertility, dwindling yields, increased pest menace, decreasing ground water resources – to name a few.

Again refer to figure (b) and you will notice that industrial farming basically short circuits the cycle by directly replacing soil nutrients with synthetic fertilizers and chemicals. How are synthetic fertilizers and chemicals produced? The answer is "Oil" - with all its controversies and the politics. The present dominant way of farming is essentially breaking the life sustenance cycle and turning it into a linear flow based on energy sourced from Oil. Now this is some food for thought.

Proponents of industrial farming claim that natural farming is not economically viable but they ignore the true cost of "industrial farming" after factoring externalities. Another argument made by proponents of industrial farming is based on the myth that crop yields of natural farming are low and cannot meet our growing population's food demand. I call it a myth because it is based on false notions of "productivity". I have deliberately not

included many other factors in this article. Factors such as industrial-animal-farming, skewed public policies & subsidies and politics that will make this subject even more complicated to discuss.

New way of farming:

Is there a new way of farming that is based on the philosophy of natural farming and takes advantage of modern science & technology? Yes, there are already communities both in developed and developing countries doing this in small and large scale. The growing market for organic produce has very many interesting players and one can find innovative working models. However, I do have a word of caution for organic produce. Recently big corporations have entered this lucrative market to chase big profits and they are only interested in adhering to the rules of organic certification (some of which are fuzzy) and not interested in the essence of organic farming.

Several modern techniques practiced along with intercropping and crop rotation with legumes makes small scale natural farming a success story. Let me focus on one such modern technique widely used in India. If you remember, compost is natural manure which increases soil fertility. Several new methods of composting which are based on scientific research have evolved recently. "Indore-method" which depends on vegetable and animal waste is a popular method that has spread even to other countries in Africa and Latin America. NADEP-method practiced in Maharashtra aims to make farmers self sufficient with manure requirement.

If you are interested in visiting a place where the principles of natural farming are practiced here in Japan, I recommend a trip to "Maioka park" in Yokohama (phone: 045-866-8328, <http://www.city.yokohama.jp/me/totsuka/kusei/maioka.pdf>). Make sure to call and request for a guided tour.

So is there anything you can do as an individual? You eat thrice a day - you get to vote thrice a day. Pay attention when you are shopping food products. If possible buy locally produced food that is seasonal and organically grown. Look for below logo if you want to buy Japanese certified organic produce. Remember my warning, do not blindly buy organic produce, do some research. The most important thing is to be conscious of what you eat.



Refer to figure-b again. For the future of our children, that cycle has to be self sustaining.

"Life is given to us, we earn it by giving it". □

Anjali