

Microcosmos

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An ecosphere, referring to "microcosmos", is the epitome of earth ecosystems. Given that a water tank, which is filled with water, sand, pebbles, waterweed and fish, is completely isolated from the outside world except for the certain amount of light and heat energy penetrating through the glass of the tank, the depiction of a complex food chain system is rather simply interpreted. That is: waterweed starts assimilating carbon dioxide by photosynthesis and generating oxygen; fish eat and excrete; its droppings are decomposed by bacteria; decomposed substances turn to nutrient to waterweed. If the balance of oxygen and trophic level in whole system is better off, fish grow and increase. If the deficiency in food and oxygen occurs due to the overreaching number of fish, weak ones are first to die, then debris of bodies play the role to restore equilibrium in such life cycles. With due care and observation, fish survive for generations even in such "microcosmos".

Now that the remarkably well-balanced and absolutely isolated micro world is constituted, the anxiety of ruining an entire system never fade. Indeed, this ecosphere experiment is literally the micro-model of our life on earth and implies that the exquisite balance of natural life chain that involves the interdependence between animals and plants. If the reciprocal balance is severely collapsed, extinction of all living things on the earth is unquestionably accelerated.

With exploitation of modern technology, human beings rather verge on losing the balance necessary to maintain the sophistication of life cycles. However, as early as Edo era (1603-1867), the Japanese established a basic and simple life style that requires only a least amount of solar energy thought within 2 to 3 years. In that era, the very best of the recycling techniques peaked and prevailed as common notion to the society by making the utter use of the fast-growing plants.

The major industry of the late Edo period was rice growing, with which the people could harvest 30 million-*goku* or 4.5 million tons of rice and 5 million tons of straw per year. All rice was consumed in a year except for the small proportion in stock. Straw was useful in many different ways, that is, 50% of that was turned to compost, 30% was flamed as fuel and to make potash fertilizer, 20% was used to make the crafts necessary for daily life. These straw crafts such as sandals, mats, rice-bags and huts after worn out were burned and returned as fertilizer or ash to the ground in a year.

Almost all daily necessities made from the fast-growing plants were in some way circulating between the ground and the people all a year round, though the consumption amount was much less than rice. Rape oil used for lighting at night, for example, was simply grown by the sun showering the light onto rape blossoms from spring to summer. Paper was made from barks of paper mulberry trees that sprouted in spring and grew faster enough to be cut off in a year, not necessarily waiting for a few decades to grow. The use of the fast-growing bamboo was as well common as that of other plants, so that a great many of bamboo crafts was applied as farming and kitchen utensils in everyday life. Materials for clothing were mostly silk, cotton and linen which took only a few months to grow. Of all woods, the amount of logs smoked to make charcoal merely required one a few hundredths of woods that normally took a year to grow. Hence, the Japanese wood in Edo era grew thicker and thicker as a result.

The use of the products made from the fast-growing plants was so environmentally safe and effective that an every single product was then returnable to the ground by disposing and burning them so as to make new plants grow well. In such a large city like Edo, some peculiar business was going on, that is, many merchants were trading excrements as much as other consumer goods. The farmers bought them to fertilize their vegetable gardens and rice fields. Even ash from firewood turned to the major demanding item that was attractive enough for the merchants to run good business. Indeed, excrements and ash were traded in great volume for the purpose of returning them to the ground.

Even though Japan in Edo era was of course far poorer than today, the people lead relatively wealthy life that had reached without any colonial or bondsman regiments while the world in those days was still conflicting. Japan had been maintaining its refined technologies and inherent potentials during the Edo period, or for a quarter of century. We, the descendants, therefore take the liberty of studying great assets passed over from our ancestors, whose wise ideas will be self-examining material valuable for Japanese today.

(translated from Japanese by Chikako Kamemoto)