

## **Soft Landing Into The Twenty-First Century The Requirements**

Teruo Higa  
Professor of Horticulture  
University of the Ryukyus, College of Agriculture  
1 Senbaru, Nishihara, Okinawa 903-01 Japan

### **Abstract**

Since the Rome Club published its report, "Limits To Growth," the following have been accepted by the present generations as common goals to create a better world for future generations: the efficient use of our limited natural resources, and the control of the growth of population which shows a tendency to ever consume more and faster.

This movement has so far led to a variety of revolutionary changes in energy-saving technology as well as the adoption of birth control by governments in Asia such as China, India, and Indonesia. Since the end of the Cold War, a typical representation of confrontation and competition, the concept of coexistence and co-prosperity have become more viable and acceptable. The goals we wish to accomplish may be difficult, especially, if we proceed with the present method and style of consumption-oriented economic activities and with the burden of an ever growing population. As barriers among nations, economic and otherwise, are being removed, it not only eliminates the conceit of an otherwise isolated nation but also helps to make one nation's problem a shared and more easily and quickly solvable world problem.

As we approach the twenty-first century, people have started accepting the idea of a common goal of creating a world where people thrive towards coexistence and co-prosperity beyond religious, political, and ideological differences.

In a world of limited resources, desires extravagant and beyond its permissible level would always lead to a state contrary to coexistence and co-prosperity. Therefore, unless we resolve the problem of shortage, we will not be able to firmly establish coexistence and co-prosperity.

When we consider the phrase "soft landing into the twenty-first century," it is apparent that we accomplish the following: resolve the problems in our current education system, provide the technology to replace the consumption based economic activities with that of resource-recovery and recycling, and provide fundamental solutions to environment, food production, health care, and energy, all of which are presenting threats to humankind.

Our present approach, the application of effective microorganisms, has started gaining wide attention as the only technology available now. It has been applied in a wide variety of areas in the environment, food production, medicine, energy, and industry. It is expected to be a breakthrough technology promising a soft landing for the people into the twenty-first century.

### **Introduction**

I believe that, in order to make the future of humanity whole, the practical application of microorganisms is indispensable. At the present time, we would like to offer all of the participants information regarding the present situation and possibilities of EM technology, and the work we have been conducting on the applied technology of effective microorganisms.

### **What Is EM Technology?**

EM is an abbreviated designation from the term "effective microorganisms". Generally speaking, it is a technology that applies effective microorganisms. EM is not a specific type of microorganism, it is a mixture of groups of microorganisms that has a reviving action on humans, animals, and the natural environment. And, most of these microorganisms have been used in food processing and in the field of medicine. Its safeness has been confirmed from many years of use, and research facilities in Japan and outside have given investigative results saying that even if drank

by accident, there is, in particular, no problem. Out of the many countries that are using EM, there are those that have given permission and judged that it is suitable as a beverage. And, not just in agriculture, sanitation administrations have actively made practical use of EM as well.

Consequently, these days, where registration permits have been filed in countries throughout the world, the circumstances have been where permission to produce EM have been granted, and in the United States, in California, with the strictest standards in the world, EM is allowed to be manufactured and sold.

EM technology branches into two methods. One method utilizes microorganisms in a direct manner, and the second method involves the practical use of the by-products of EM. The former is mainly centered on the environmental fields and the primary industries of agriculture, livestock, forestry, fisheries, and so on, and the latter is mainly centered on the energy fields in manufacturing and medicine.

What effective microorganisms have in common in relation to the two methods is antioxidation. The effect of antioxidation is to prevent the oxidation of matter and living bodies, which is to state nothing new. Ultimately, on earth, everything that exists has the nature to deteriorate through oxidation and collapse or die. Also, human illnesses, taken from a different point of view, is due to an excess oxidation of the genes, a way to express a malfunction.

Antioxidation substances generated by effective microorganisms and the antioxidation undulation emissions that accompanies them, has the strength not only to repress the harmful effects of oxidation, but also to return matter, that has already been oxidized, to its original state. This is regardless of whether or not it is a living matter or not.

This action has been said of up to now, is the release of entropy by a reaction of oxidation to reduction. On the contrary, it is the ability to recover entropy through the reaction of oxidation to antioxidation. The effects of antioxidation mentioned here has caused a difference in the activity of the S.O.D. of living bodies, a term used in the medical science. (S.O.D. is a free radical deionizing enzyme or superoxide dismutase.) With the bioactive substances generated by EM, some of which does not directly activate the S.O.D., remarkable results have been observed where the deactivation of free radicals (active oxygen) have been occurring in matter and inside living bodies.

The basis upon which EM technology stands is not limited to a narrow scope of one field, agriculture, this is since EM suppresses excess oxidation, eliminates them by generating antioxidants, and since it is microorganisms of multipurpose use.

### **The Significance of Entropy-Recovery Technology**

The development of EM technology started in 1968 with the intention to improve the quality of crops and create countermeasures against the difficulties of continuous cropping, and the prospects of its practical use did not materialize until 1980. EM became a practical product in 1982, and spread throughout the world as the organic farming movement increased. Presently, there are over sixty countries in the process of or are utilizing EM where more than ten of these countries have incorporated it into their national policy.

In these countries, by linking the problems in agriculture and the environment together, they are at the same time solving the problems of sanitation. The catch-phrase of EM technology is safe, benign but effective, low cost, high quality, and high productivity. The ultimate goal of EM technology is to construct a reviving type society of coexistence and co-prosperity.

With the human population ever increasing, with limited farmland and limited natural resources, and with our environmental problems, this grave reality tends to make us see our future with pessimism. The general understanding people have is that even though coexistence and symbiosis may be possible, especially for solving our problems, mutual prosperity is not.

Consequently, in order to make the whole of humanity co-prosper through coexistence, we must solve our problems from the very roots of society, and we must construct a society where poverty, sickness and conflicts have no chance of developing. For that purpose, through entropy-recovery technologies which the evolution of the earth is based on, there is a need to construct a system of technologies and a system of society centered around such concepts.

Before humanity created civilizations and the human population exploded, the earth had developed the function to recover entropy, take in the unlimited amount of energy from space, and it isn't an exaggeration to say that the earth has continued to evolve without limits and with abundance. The results of which are the existence of oil, coal, diverse minerals, plant and animal resources.

Frankly, the existence of humans today has become contrary to earth's evolution: building without restraint, using up and discarding an enormous amount of resources, and gushing out pollution. We have thus become a burden to the planet, contradicting the natural evolution of the earth. Left like this, continuously contributing to an excess buildup of entropy through our pollution, the public would agree that looking at ourselves, we are headed down the road of self-destruction.

The excess of entropy will lead us to severe pollution and oxidation. Furthermore, if these conditions of severe pollution and oxidation continues to progress, an environment of harmful microorganisms and viruses will proliferate and become stronger, and not only will the environment become further polluted, but it will also cause the outbreaks of disease carrying insects and incurable diseases endangering all higher life forms.

From the present problems that is being generated on earth, there is an excess outpouring of entropy everywhere, and to solve these problems, there is the necessity to move towards and center on the entropy-recovery type of technologies adapted to earth's evolution.

### **The Construction of A Reviving Type of Society Based On EM Technology**

Based on the theory mentioned up to now, entropy-recovery technologies may be said to be an impossibility. Scientific discussions aside, grounded on having had confirmed that EM technology can synthesize substances on a systemic level, we can acquire the solution to all sorts of problems from the shortages of food, resources, and so forth, to environmental, health, and energy problems.

EM technology can make city perishable waste, paper unsuitable for recycling, and other organic waste recyclable, and such recycled products can then be used by the primary industries of agriculture, livestock, forestry, and fisheries into quickly producing the best at a low cost. It can also make it possible to recycle waste water from manufacturing and the home almost indefinitely within a self-contained system.

When this technology becomes widely accepted, it will be capable of reducing the staggering expenses dealing with garbage and water problems.

EM technology also has the remarkable capacity to recycle plastics, paper, rubber, and textiles at a low cost, and high quality recycled products have begun to appear from these. An EM ceramic type of this technology which can be made from such things as burnt coal ash and blast furnace ash, has multipurpose uses. In an antioxidation condition, carbon dioxide absorption by the microorganisms is several tens of times faster than terrestrial plants, and the conversion of various natural resources is easier.

The ability to harvest several times more from the same farmland is really the same as being able to convert several times the amount of carbon dioxide into food, and by the same proportion it is also cleaning the environment.

Also, if EM technology is put into practical use, all sorts of materials can exhibit additional functionality. If EM generated antioxidant substances are mixed into plastic and made into plastic bags, and if rice cultivated with EM is placed in such bags, even after five years it will be just like standard quality fresh rice.

This technology can benefit the processing of agricultural, livestock, and fisheries products, and improve the various foods to maintain freshness. When this technology becomes widely used, food preservatives will become unnecessary. From a larger perspective, looking at the technology as naturally preserving foods over a long period of time, regardless of a year's harvest, good or bad, it can supply high quality foods all over the world and steadily. This indirectly supports a grand proposal to solve our food problems.

Since the use of sealing plastics, for instance, in packaging and insulation, is a standard, utilizing EM, there is no need to air condition the storage facility. It is enough to pile the

merchandise on a cement foundation that was made using EM and cover to insulate the merchandise with a plastic that was treated with EM.

The application of EM technology has begun to quickly spread into construction and road building. By just adding 1% of EM to the cement powder (dry weight), the surface-active strength will increase significantly, and the water clusters will become smaller. For these reasons, the cement dry-hardens faster, that is, what use to take twenty-five to thirty days, now only takes three or four days before the cement-molding frames can be taken off. Besides the increase in the strength of the cement, the reinforcement within concrete will not rust, moreover, the aggregate alkalization phenomenon, basically defects, will not occur. The effect is, the life span of structures will extend several times of what it is now.

From this principle, the application could not just be used on the various construction materials and public works, but also, for the old and easily damaged historical sites by high pressure injection of antioxidant substances, that is EM, into the structures. With all that it can do, it can also remarkably prevent termite infestation, and so, on the environment as a whole, it is possible to create what the Japanese call "Iyashiro-chi" which means a place where everything goes in favor of life, longevity, durability, health, and so on. As for the adaptation of this technology for the reconstruction of the Osaka-Kobe area after the great earthquake, over time it is not unlikely to create an Iyashiro-chi throughout this entire region.

In the fields of energy and the prevention of deterioration, the application of EM technology is in the process of becoming revolutionary. As a low cost complete rust prevention technology, various mining and manufacturing commodities have already shown the remarkable effects of the deterioration prevention of the technology. Also, fuel efficiency has been confirmed to increase by more than fifty percent, and due to the prevention of rust, electric lines has also been confirmed to increase in capacity.

Concerning health, the immune system can be reinforced, and accordingly, genes are able to self-restore themselves to normal functions. For most incurable diseases, treatment through conventional medicine has been difficult, but now there is hope and there are already several reports confirming the effectiveness of EM on incurable diseases.

From all that has been mentioned, if EM technology is applied everywhere in every way, there is the limitless possibility of reducing the world's waste to nearly zero. A system can be created where excellent quality products are made inexpensively, and using the products with care over a long time, and if they becomes useless and reprocessed and turned into yet higher value-added products, then we can solve all the shortages in this world.

Since it is too much to mention here in detail the problems concerning energy supply from biomass and substitute energy resources, it should be stated that, what has been confirmed up to now regarding high-output energy technologies, they are also, correspondingly, considered cost-wise effective.

## **In Conclusion**

EM Technology is said to be the technology of a new industrial revolution because of what it is capable of as mentioned above, and just as food, water, and air are everywhere, it is therefore necessary that this technology be likewise widespread. Details can be found in the following books, "Revolutionary Technology to Save the Earth" and "Revolutionary Technology to Save the Earth 2". Considering the present condition of the earth, it is necessary to further the rapid spread of this technology without hesitation.

The following organizations, inside and outside of Japan, are leading the efforts in EM technology: with regards to agriculture, a foundation called International Nature Farming Research Center; with regards to the environment, the Foundation for Earth Environment and a foundation called the Japan Flower Association; with regards to manufacturing, health, energy, and covering all else comprehensively, EM Research Organization.

Indonesia, Bhutan, and Malaysia are progressing with EM technology in cooperation with the United Nations' UNDP. It is spreading steadily in India and in China. There are many requests for our assistance from many countries, including, countries in Africa and the Former

Soviet Union, and because of this, we are actively seeking people mainly with experiences in those countries to go over there and widespread this technology.

In any case, the profits gained from all over the world resulting from EM activities, have been put to use in the respective countries for their development, and it is not an exception in Japan as well. Defining authentic technology as that which produces without waste, at low cost, and beneficial to people and the environment, it is of real significance that we have organizations and groups of experts who focus on authentic technologies to reconstruct society towards coexistence and co-prosperity.