

# **The Technology of Effective Microorganisms -- A Holistic Approach to Sustainable Development in the Democratic Peoples Republic of Korea**

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Mr. Chairman, distinguished guests, participants of the International Conference on EM Technology and Nature Farming, and dear friends and family of EM technology.

It is with significant happiness that I stand before you all today to present the Technology of Effective Microorganisms, generally called EM technology within the concept of Nature Farming. I hope to present the feasibility of using EM to develop a sustainable system of agriculture that is safe, environmentally friendly and also acceptable to humankind, based on both research and experiences.

As you have heard earlier, EM technology was combined with a system of Nature Farming developed by Mokichi Okada in the 1930's. This marriage between Nature Farming and EM took place in the early 1980's and has turned out to be a very successful story. The concepts were introduced to the world in 1998, and the progress has been very promising and successful. This is indeed a success, where slowly but surely, we have shown the world a system of agriculture and environmental development that is of low cost, safe, effective and versatile.

The concepts behind EM technology and its development have been presented by me and many others at many international fora. The publications cite this very clearly. Thus, I will not go into details of the making of EM, its components and application. This information is readily available even in the form of publications of our organizations, the International Nature Farming Research Center, Atami, Japan, EM Research Organization of Okinawa, Japan and the Asia Pacific Natural Agriculture Network, Thailand.

The success of EM technology in agriculture and environmental development is best highlighted by examples from all over the world. Its acceptance has been very good. However, today, I will take an example that is most appropriate to this conference to show that the technology of EM along with Nature Farming is a really holistic approach to agricultural development in a sustainable manner. The example is this great country of DPR Korea, which has accepted the technology of EM in a national wide program.

The development of the DPR Korea is based on the Juche idea of the Great Leader Kim II Sung. This concept is also followed by the beloved leader Kim Jong II at the present time. The central theme of this idea is that humans are at the center of development. They have to will power and capacity for both development and destruction. EM technology also respects this concept. EM is made and is used by humans to overcome the destruction that they carried out in the form of intensive mining of the environment.

Thus, the two concepts are in harmony and together have shown that humans can make this earth a better place for themselves and also the future generations.

The introduction of EM technology to this great country took place in 1994, at the time of forming the principal sponsoring organization of this conference, EM Research Organization. (This introduction was due to the lowering of agricultural productivity in DPR Korea from 1990 due to both natural and man made disasters.)

The first introduction of EM technology to the DPR Korea took place under the auspices of the Central Committee of Korean General Association in Japan. At first, there were many objection, even within the Central Committee of the Korean General Association. However, due to the diligence and fore thought of Dr. Hyon Sung Bae, Vice Chairman of the Korean Association of Science and Technology of Japan, who had experienced the benefits of EM, the technology was accepted by the DPR Korean authorities as a national project.

At the inception, the EM to DPR Korea was supplied through the good offices of the International Nature Farming Research Center in Japan. They also sent technical officers to develop the program. Demonstration farms were established and case studies were carried out, all with resounding success within one year of introduction. Thus the demand for EM grew rapidly within DPR Korea. However there was a serious problem of supply due to financial difficulties, although the Central Committee of the Korean General Association made all possible attempts to rectify this situation.

In 1995, DPR Korea experienced one of its worst natural disasters -- a nationwide flood. Soon after this in the latter part of 1995, I received an official invitation from the Central Committee of Korean General Association, stating that fields that were supplied with EM were not seriously damaged by the flood. They saw for themselves the effectiveness of EM and requested further help, although there were financial difficulties.

Although I wanted to help, there were problems of communication due to the absence of any form of official contact between DPR Korea and Japan. Travel to DPR Korea by officials, including professors such as myself were not permitted.

However, the mass media highlighted the food problems of this great country and thus I made the first visit in April, 1996, as the President of the Earth Foundation of Japan.

The first visit was indeed a bitter experience for me. I saw devastated fields and broken bridges everywhere due to the damage by floods. The excessive use of chemicals had destroyed the agricultural ecosystems, which had resulted in greater damage. The national income of the country was affected and agricultural inputs such as fertilizers were beyond the reach of the farmers. Soils could not be improved and diseases in crops, especially rice, was rampant. Farmers were selling all that they could, even the straw for extra income, while others were burning this valuable organic matter for warmth in winter. Thus organic matter contents of soils were being depleted with no solution for rectification. The result was that productivity was declining steadily, although the hardworking farmers strived to enhance production. This was similar to the situation in Okinawa, my homeland, just after the second world war.

The disasters facing DPR Korea were imminent. This was foreseen internationally as a disaster of a great country. Thus, I promised to supply EM with the establishment of an EM production unit. Thus an agreement was reached between the officials of the Academy of Sciences of the DPR Korea and EM Research Organization of Okinawa for active support and participation. This resulted in the use of EM for 50 thousand hectares of land for the first time in 1996, just four years ago.

Nature was not kind to this country again in 1996. Another flood was experienced this year. However, the fields using EM were not extensively damaged, nor were affected by pests and diseases, as expected after a flood. Hence I was determined to help this great country by establishing an EM factory. This was made possible by the generosity of the Central Committee of Korean General Association in Japan and its affiliates. In the rice season of 1997, the new EM factory supplied 50 thousand tons of EM for 300 thousand hectares. The bountiful harvest that year showed the effectiveness of EM very clearly.

The EM factory was expanded in 1998 to a capacity for supplying EM to over 600 thousand hectares of rice fields. This was a relief and the stories of food shortages were less evident. It was also a relief to all the people of DPR Korea to learn that there was a simple and effective way to overcome food shortages, which helped the development of the nation.

The culmination of this cooperation took place in 1999. The Government of DPR Korea, the Central Committee of Korean General Association of Japan and EM Research Organization of Okinawa, Japan founded the International Friendship EM Research Center as an event of the 50th anniversary of Nation Foundation.

The production capacity of the EM factory was further enhanced to make EM for over 1 million hectares of land, which yielded over 5 million tons of rice. Thus a good harvest was procured in 1999. Although there are still some shortcomings in selected pockets of land within the country, the situation has improved dramatically and I am sure that this great country will have all of its food requirements in the very near future.

This development seems a fairy tale. However, the progress was not easy. There was much opposition, especially from sources such as the Japanese Society of Soil Science and Plant Nutrition. These organizations emphatically denied the benefits of EM, and all who were not in favor of EM provided incorrect information to the world, including the DPR Korea. However, with foresight and national interest in mind, the Great Leader Kim Jong II decided to use EM in DPR Korea. His Excellency realized the benefits of EM and thus a national project was launched with His Excellency's blessings and guidance. This has helped reduce the crisis of food in this great country, which was reported everywhere. This fact is also evident by the absence of any food aid in the historical talks held on the 13th of June, 2000 between the leaders of the two Koreas. This is indeed a landmark, and we do respect the great leader Kim Jong II for his wise decisions and forethought for the welfare of his people.

There is a very famous saying, "Agriculture is the holiest industry of nation, and is the foundation of its society." This is true in all countries. Historically agriculture was used to produce food, make farmers rich and also preserve the environment. However, with time, this system changed to one of destruction. The advent of the excessive use of agrochemicals disturbed the ecosystems. The toxicity problems of heavy metals was enhanced by the use of pesticides, which activated free radicals. Thus, fundamentally, the soil was made to discharge harmful compounds rather than nutrients. The accumulation of these chemicals, especially the residues of toxic agrochemicals affected the health of animals and even humans. Hence the destructive nature of agriculture was recognized, and is now reported widely in many international publications.

The toxicity problems was annexed with another harmful aspect in the recent past. This was the use of gene modifications. This system looks only at plants and not the entire ecosystem which is responsible for productivity and sustainability. This unlawful and haphazard use of techniques, such as gene modifications and transfers have compounded problems. A clear example is the development of herbicide tolerance in crops, and this has led to greater use of these toxic compounds. This was experienced by me in the United States of America last month. Although gene recombinations are likely to enhance production, expand agriculture in marginal conditions and even enhance shelf life crops, all these are based on simple preliminary studies. Thus there is an acute danger of unwanted use of these techniques, without proper testing. This fact

was made evident last month, at the International Scientific Conference of the International Federation of Organic Agriculture Movements (IFOAM) held in Switzerland.

In contrast to the above, the technology of EM is simple, comfortable, of low cost with high efficiency and helps achieve sustainability. The most important factor is that the technology has been well proven to work marginal conditions, and under farmers conditions. Although some studies even in leading universities of the world do not show the effectiveness of EM in pot studied, which scientist tend to work with, farmers in these countries use EM very successfully. Thus, is this not proof of success and easy adoption? Farmers are the best judges of successful experimentation and production.

The above concept was well understood by the authorities of DPR Korea. EM was therefore chosen to be one component of the General National plans for agriculture of this country. The other were selective breeding, selecting of crops to match environments and base preparation. This, we are told was decided under the guidance of the great leader Kim Jong II, the General Secretary of the DPR Korea. It is indeed a commendable feature and we respect His Excellency for this wise decision.

The world today is being pressurized to produce more food from diminishing resources. This is by using excessive amounts of agrochemicals. However, the folly of these techniques have been realized by the western world, and countries such as Denmark, Switzerland and Austria are restricting the use of agrochemicals and switching to natural methods. However, these changes are also beset with problems with no proper planing to counteract the lower production and high costs.

It is with humility that extend the Technology of EM to such situations. EM has a holistic beneficial impact on agriculture and sustainability of ecosystems. Experience in DPR Korea has shown that natural hazards have been reduced with the initiation of using EM. Application of EM in winter raises soil temperatures due to microbial activity. This facilitates the growth of crops such as winter wheat even under cold conditions. The extents of cultivation have expanded especially with wheat, and the residues are used as organic matter for the succeeding rice crops in summer. This not only enhances production but also sustainability. This is the holistic nature of EM and the benefits are very clear in this great country.

The program of EM in DPR Korea is a very successful venture. It work under the guidance of the Great Leader Kim Jong II. The cooperation between the Central Committee of Korean General Association in Japan, the EM Research Organization and International Nature Farming Research Center, has proven to

be a model to the world. As a very close associate of all three organization. I am very happy that such a program exists. With time and further development I am sure that the DPR Korea will show the world the success of EM and Nature Farming and will contribute to the global development by being a model country for EM technology.

The present situation has arisen after 20 years of developing EM. It is indeed a significant event. Very recently, at the G8 summit in Okinawa, Japan, EM was introduced to the leaders of the as "an advanced technology of Okinawa that will help the world." EM technology has had a successful past of 20 years. The best is yet to come, and you all will be a part of this future success. Thus, in conclusion, I request all of you to see, discuss and debate on the issues, raise questions and be convinced of the success of EM. Thereafter, my humble request is to go back to your respective countries and promote this technology further. I am sure you too will succeed in the same manner as this great and beautiful country, the Land of Morning Clam, the Democratic Peoples Republic of Korea. Thank you.