



PROPOSAL

ON

UNITED ARAB EMIRATES

Deodorization at the Compost Plant
and
Manufacture of High Quality Compost
from
Municipal Waste

USING EM TECHNOLOGY

by

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1. Introduction.

United Arab Emirates (UAE) is comprised of seven Emirates namely Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, Ras al-Khaimah and Fujairah emerged. The population of UAE is estimated to be more than 3 million and by the year 2005 it will be about 3.48 million.

His Highness Sheikh Zayed Bin Sultan Al Nahyan, the President of United Arab Emirates is distinguished by his acute insights, wisdom, far-sightedness, far-vision, fairmindedness, fairness and commitment and belief to improve the lot of his country men with dedication, seriousness and follow up.

UAE has emerged into a modern country by undergoing a wide range of miraculous developmental changes in all fields and aspects of life under the great leadership of His Highness Sheikh Zayed Bin Sultan Al Nahyan. The marvelous achievements made particularly in the field of floriculture, horticulture and agriculture by converting the deserts, sandy areas and dry lands into lush green areas of roses and flowers, fields of green houses and food crops, gardens and fruits. This is due to the supreme interest and follow up of Directives by His Highness himself to enhance and promote social and economic up-lift of his countrymen.

His Highness Sheikh Zayed Bin Sultan Al Nahyan took keen interest to fight the menace of environmental pollution and issued Directives to control pollution being caused by industrial solid wastes, effluent, sewage water and solid city wastes. This resulted in the establishment of Abu Dhabi Compost Plant in 1977 to protect environment and public hygiene by changing the city waste and green waste into organic compost to be used in the areas of agriculture, horticulture and floriculture by increasing fertility and physical properties of soil.

2. Environment protection with Abu Dhabi Compost Plant

To protect environment Abu Dhabi Compost Plant started working in 1977 with daily input capacity of 120 tons of solid waste to give output capacity of 50 tons of organic matter. With an increase in population as well as production of city solid waste the capacity of the Abu Dhabi Compost Plant

had to be increased, even a new branch in Liwa was opened in 1999 to control environment pollution. The Abu Dhabi Compost Plant has been provided with latest modern machines to overcome the problem of increased solid city waste and to produce more organic compost to meet the requirements in respective fields.

Abu Dhabi Compost Plant by the end of the year 2000 treated 3 157 663 tons of total solid waste (2 852 421 tons city waste and 305 242 tons green waste) and produced 1 374 667 tons compost (1 218 581 tons madina compost and 155 986 tons qaria compost).

3. Stages of production

Nine stages of manufacturing have been given in the publication named “United Arab Emirates, Abu Dhabi Municipality, Abu Dhabi Compost Plant”. These are given under action plan, material and methods, and deodorization.

4. Quality of Compost

The process of composting is completed in 3 months. The nutrients values of the compost is enhanced by mixing 50 Kg NPK in 100 tons Compost and 25 Kg Urea in 60 tons Compost during the process of manufacturing compost. The harmful bacteria, insects, nematoda and other pathogens causing diseases are considered to be killed at a temperature of 60-70⁰C generated in heaps formed from crushed refuse and left for fermentation for 3 months.

Scientifically speaking this aerobic method of composting has specific limitation considered from microbiological viewpoints. Some pathogens still remain/ exist at this temperature (60-70⁰C) and becomes active when suitable condition are available. This disease producing pathogen can be eliminated with use of Effective Microorganisms products and techniques. Besides this the adaptation of EM Technology increases useful microorganisms population many folds (by billions) as well as macro-and micro-nutrients (N, P, K, S, Ca, Mg and Fe, Mn, Zn, Cu, Mo and B) which are readily available to plants because of an improvement in the soil fertility and physical properties.

5. Constraints and shortcomings at the Compost Plant.

Unpleasant stinky bad smell (odor) exists at the Abu Dhabi at the Compost Plant. With this the air pollution is created and the factory workers and the residence of the surrounding areas do not find good natural air for inhaling. The odor affects the lungs and with that other diseases occur. The presence of this odor is also spelled out in the publication “United Arab Emirates, Abu Dhabi Municipality, Abu Dhabi Compost Plant for Environment Protection” at page 13. The management was compelled to change open production system to close production system to minimize bad smell to the surrounding areas in March 1977. This pungent odor (smell) still exists because it is impossible to eliminate by simply changing the open system to close production system. The offensive ODOR is generally caused by the an admixture of among other things ammonia, hydrogen sulfide, trim ethylamine and methyl mercapton and large population and activity of pathogens found in the city solid waste consisting of organic waste and kitchen garbage. The

application or use of various type of chemicals, inspite of their higher cost, could not show there effectiveness in eliminating odor as compare to the authenticity and efficacy of EM Technology, the latest effective and beneficial microorganisms technology developed in Japan and is safe to apply and environmental friendly. The similar experience was encountered in Switzerland at a plant dealing with 5-20 tons city solid waste per hour although the plant was handling and recycling the solid waste by means of a most advanced salting and processing procedure. The plant used ozone to treat the bad odor but failed. Here EM worked and the expenditure on ozone (which was very costly) was stopped. EM acted as a very powerful deodorant and eradicated the terrible stench completely as if by magic. Similarly EM removed odor in the kitchen garbage processing in Kani city plant in Japan and at a livestock farm. Even in Pakistan EM eliminated strong pungent odor at the leather industry and converted the bad oily sludge of petroleum industry and the sludge containing chromium (Cr very dangerous for human health) into bio sludge and finally bio fertilizer. The bio fertilizers were applied in agriculture to rice and onions and good crops were obtained.

6. The role of EM to overcome constraints and shortcomings

The constraints and shortcomings relating to killing of pathogen, improvements in the nutrients concentration and finally the most important elimination of stinky, unpleasant and offensive odor can only be overcome with the adaptation of EM Technology. The same is summarized below.

7. What is EM!

EM is an abbreviation of effective microorganisms. EM is a combination of various beneficial, naturally occurring microorganisms mostly used for as found in foods. It contains beneficial organisms from 3 main genera: phototrophic bacteria, lactic acid bacteria and yeast. These effective microorganisms secrete beneficial substances such as vitamins, organic acids, chelated minerals and antioxidants when in contact with organic matter.

There are aerobic and anaerobic bacteria. The anaerobic microorganisms are lactobacillus bifidis and other various strains of intestinal bacteria, zymogens (zymogenic microorganisms or fermenting bacteria), sulfur / sulfate reducing bacteria, chlorobacteria and brown green photosynthetic bacteria. In the group of aerobic bacteria included are blue green algae, azotobacters, bacillus sp. (bacillus subtilis) acetobacters, methanogens and sulfur bacteria, Lactobacilli and photosynthetic bacteria, which are important components in the EM formula, belong to the anaerobic group. They are now recognized as being effective in the control of diseases.

The EM Technology, with a combination of all the products of EM in proper proportions to be applied at definite times and intervals, is a tool with which desired results with respect to purity and decomposition of pollutants inclusive heavy metals are possible to be achieved through bio-remediation of the matter. EM controls the propagation of the harmful microorganisms that cause contamination and prevents oxidation effectively with the production of antioxidants. Actually two kinds of effective microorganisms coexist within

EM: zymogenic microorganisms and synthesizing microorganisms. Decomposition achieved with Zymogenic microorganisms reduces organic matter to a soluble state. This is the best food for the bacteria in EM and they readily consume it. Large quantities and wide variety of both organic and amino acids as well as antioxidizing enzymes are produced. This makes for the EM easy to bring about break down and decomposition of chemical substances, which are a major cause of pollution.

8. Invention and development of EM

Prof. Dr. Teruo Higa, the University of the Ryukyus, Okinawa, Japan started his research on effective microorganisms in 1968. With sustained and diligent research he produced the first batch of effective microorganisms, which eventually called EM in 1980. EM is available in liquid form. EM is produced through a natural process of fermentation and not chemically synthesized or genetically engineered. Thus, EM is neither a synthetic chemical nor a medicine. EM Technology can be considered a natural technology with beneficial effects in all the areas and has shown no adverse effects on plants, animals, humans and environments after decades of application. EM is recognized and classified as safe material to be used in the field of agriculture, poultry, fisheries, animal husbandry and environments to treat polluted water, solid wastes such as kitchen garbage, city wastes, petroleum oily sludge, tannery's sludge and to eliminate odor in industries of tanning and waste processing plant. Recently it has been used to eliminate odor at animal farms, at zoo and in bathrooms.

9. Research activities relating to EM

The invention of EM is a miracle and for its use in various fields research is a pre-requisite. EM Research Organizations were established in various countries to find out solutions in the field of agriculture, animal husbandry, poultry and environments and to promote the application of EM in respective fields. These are describes briefly here.

10. Foundation of Asia Pacific Natural Agriculture Network

In the beginning EM was used to enhance productivity of crops under conventional organic farming. The results were remarkable and the expansion process of EM Technology began in 1989 at the international Kyusei Nature Farming conference held in Thailand. The Asia Pacific Natural Agriculture Network was formed in order to scientifically validate the technology of effective microorganisms and to enhance its use in the region. This network, which included 13 countries ranging from the west coast of the United States of America through Asia to Pakistan developed the mandate to establish an international program for promoting research, education and extension of nature farming with EM Technology.

11. Foundation of EM Research Organization in Japan

To demonstrate the amazing potential of EM and to assist in resolving problems relating to almost all the areas EM Research Organization was founded in 1994 in Okinawa, Japan. Since then EM Research Organization promotes and disseminates EM Technology all over the world through its

regional branch / liaison offices, Joint venture companies, NGO, NPO, affiliates and local Governments. EM Research Organization has a team of over 100 researchers around the globe conducting EM research in different fields to uncover viable solutions for existing environmental and health problems.

12. Establishment of EM Research Organization Regional Office for Middle East & Central Asia, Lahore, Pakistan.

EM Research Organization Inc., Okinawa, JAPAN established its Regional Office for Middle East & Central Asia at Lahore, Pakistan during June 2001. It is headed by Mr. Syed Ali as Principal Officer. The research activities are carried out with a team of qualified personnel having M.Sc and Ph.D degrees. EM Research Organization is responsible for:

- carrying out research using EM Technology in preparation of bio active organic manures to maintain the fertility of the land to increase yields of various crops,
- carrying out research to establish formulae to be applicable in the areas of agriculture, horticulture, floriculture, fisheries, poultry and animal husbandry,
- undertaking research to resolve problems relating to environmental pollution caused by sewage and all types of industrial effluent and solid wastes, and
- demonstrating the application of EM for deodorization especially in tanneries as well as of sewage water.

Recently EM Research Organization Lahore Pakistan carried out research on the oily sludge of Attock Refinery Ltd. (ARL), Rawalpindi, Pakistan in collaboration with United Nations Industrial Development Organization (UNIDO) and National Cleaner Production Center (NCPC). Two tons of oily sludge of ARL was converted a bio fertilizer of high quality with the application of EM Technology. The reports have been published and even a generic proposal on “In-Situ bio remediation of oily sludge using EM Technology” has been given on web site.

EM Research Organization Lahore Pakistan carried out research on deodorization of tannery effluent and conversion of sludge of tanneries in collaboration with Pakistan Tanners Association, Lahore Pakistan. The unpleasant odor at tanneries was eliminated by sprinkling and application of EM on to the effluent in equalization tank. The sludge was converted to a bio fertilizer with the application of EM Technology. The bio fertilizer has been used for growing crops and flowers and to maintain grassy grounds.

13. Areas of research and application of EM

Today, EM Technology has extended its activities to over 116 countries, where it is being used in the field of agriculture, fisheries, poultry, animal husbandry and environments such as recycling of sewage water, city wastes and kitchen garbage. Of 116 countries EM is being manufactured in 45 countries.

Recently EM Technology has shown its potential to bio remediate the oily sludge of petroleum refineries and the waste sludge of tanneries converting these into bio sludge and finally into bio fertilizer. EM Technology has proven its success to treat effluent of tanneries by reducing the concentration of pollutants and eliminating the pungent awful stench.

14. Success stories of EM applications

14.1 Deodorization at a waste treatment plant, Switzerland

In Switzerland, the Olfar Technology of Switzerland developed a plant with finer system for handling 5 - 20 tons of waste per hour. It is capable of disposing of discarded and waste items. This recycling operation was capable of dealing with a huge miscellany of items ranging from scrap metals like aluminum, iron and steel as well as plastics and vinyl's, waste paper and textiles of all kinds to kitchen waste, food scraps and other organic substances. The entire accumulated mishmash of waste was finely pulverized and then separated for recycling by means of a most advanced sorting and processing procedure. There was, however, one serious drawback to all of this: the sorted and processed waste gave off the most pungent and awful stench. Despite the fact that ozone sterilization was being used midway through the process to counteract the smell. The stench itself was bad enough, but the ozone used in the sterilization process was downright dangerous. Ozone is a virulent carcinogen and as such potentially life-threatening. EM was introduced into the system at one of the earliest stages of the operation. EM was sprinkled on to the waste materials right at the start of the pulverization process before entry into the crusher. EM acted as a very powerful deodorant and eradicated the terrible stench completely as if by magic. EM further enabled the Swiss recycling operation to do away with the dangerous process of ozone sterilization and improved the running efficiency of the machinery.

14.2 Deodorization from kitchen garbage processing, Japan

Kani City, central western part of mainland Japan, has been exceptionally successful in its use of EM Technology to process kitchen garbage since 1992. The associated unpleasant smell produced by the saprogenic or putrefactive bacteria has been completely eliminated by the use of EM.

14.3 Deodorization at a livestock farm

The use of EM has banished the unpleasant odor coming from livestock farms. Offensive odors coming from livestock farms are generally caused by admixture of among other things ammonia, hydrogen sulfide, trim ethylamine and methylmercaptan. These substances just happened to provide substrate for the microorganisms in EM, who go to it and gobble them up, thereby effectively eradicating them.

14.4 Safe disposal of petroleum oily sludge as bio sludge / bio fertilizer in Pakistan

In Pakistan EM Research Organization, Lahore has carried out research in collaboration with UNIDO / NCPC on the bio remediation of oily sludge of Attock Refinery Ltd in October 2002. The oily sludge was converted to bio sludge with the use of various EM products and finally by mixing with equal

quantity of dried soil it was converted to a bio fertilizer. Agricultural trials are under progress. The heavy metals in the sludge were diminished to a certain extent. Treatment of 600 tons of oily sludge at large scale with EM Technology is under consideration by the ARL dignitaries.

14.5 Safe disposal of tannery's sludge as bio sludge / bio fertilizer in Pakistan

EM Research Organization Lahore, Pakistan has completed research trial on effluent and sludge treatment with EM products in collaboration with Pakistan Tanner Association Lahore. The tannery sludge of Eastern Leather Company was changed to a powdery farm material, was named as bio sludge / bio fertilizer because of its richness in macro and micronutrients. It is worth mentioning that Cr was reduced from 50 000 ppm to 312 ppm in the sludge.

The sludge of Siddiq Leather Works (SLW) was also treated and it changed into a powdery material. Cr was reduced to nil to 1.054% as per analysis of Soil and Water Laboratory, Agriculture Department, Government of Punjab and Environmental Sciences Laboratory, PTA, Lahore respectively. At ELC premises rice crop was grown with the application of bio sludge and EM irrigation and EM spraying. The results were satisfactory.

14.6 Reduction in the concentration of pollutants in the tannery's effluent

The effluent of SLW was also treated with sprinklers to eliminate odor and with EM extended to reduce the pollutants. The results were encouraging. On the same lines a project has been submitted to UN / UNIDO Islamabad to cater the problem still existing at the Kasur Tannery Pollution Control Project (KTPCP). The project is aimed to eliminate odor at the common effluent pretreatment plant, Kasur and to reduce the concentration of pollutants.

15. The future / potential of EM

In short application of EM Technology has the potential to contribute significantly to the general improvement of health and to sustain this in a number of ways by affording greater environmental protection and ensuring an economic food supply of safe, high-quality foods through its use in agriculture, and by solving problems of environmental pollution by means of large scale recycling operations, which would simultaneously reduce wanton use of precious natural resources.

The list of beneficial applications of EM is endless as what the human beings consider contaminated, offensive and malodorous is the food of the microorganisms in EM. Thus, there is no limit to the potential applications of EM Technology. Hence the future of the world lies in the use of EM for controlling pollution problems.

16. **Action Plan for Deodorization at the Abu Dhabi Compost Plant and manufacture of high quality compost using EM Technology**

16.1 **Material and Methods**

16.1.1 **Deodorization**

EM possesses the capacity to effectively eliminate the unpleasant odor. An admixture of among other things ammonia, hydrogen sulfide, generally causes the offensive odor, trim ethylamine and methyl mercaptan. These substances are happened to become the substances (substrate) for the microorganisms of EM. Thus, the microorganisms of EM gobble them up and the odor is eliminated because of non-existence of components of odor.

Nine manufacturing stages have been given in the “United Arab Emirates, Abu Dhabi Municipality, Abu Dhabi Compost Plant”. These are reproduced below:

- 1) The solid waste is collected inside the factory and the large inorganic matters are sorted out manually.
- 2) The refuse is crushed by hammer mills.
- 3) The metallic materials are separated by magnet.
- 4) The crushed refused is transferred to digester drum for mixing by adding water to increase humidity to 50 55 % for earlier start of fermentation and kept for 24 hours. Heat is generated due to air fermentation to 60 – 70°C to ensure killing of harmful bacteria, eggs, insects, nematoda and plant disease etc.
- 5) The drum doors are opened and inorganic matters like clothes, plastics, rubber and metallic materials are separated by screen.
- 6) Urea is added after screening to increase nitrogen (N) ratio to 2% at earlier start to fermentation.
- 7) The compost is left in heaps inside shaded places for three months.
- 8) The compost is aerated and then screened to separate inorganic matters and produced in bulk or bags and sold as demand.
- 9) Compost undergoes laboratories quality test in all production stages to match the specification of the ministry of the agriculture.

For deodorization EM products (EM –1, extended, Bokashi and others) will be sprinkled with suitable size sprinkler units (set of 10 – 20 sprinklers) attached with dozing units, which are connected to the main source of EM tanks. The material and equipments required for sprinkling and manufacture of EM are as under:

- 1- Sprinkling units, each set containing 10 – 20 sprinklers depending upon the quantity of city waste to be treated for elimination of odor.
- 2- Dozing units, each unit will be far a set of sprinklers to maintain the required pressure for sprinkling.
- 3- Mixing pumps are required to mix various components of EM for the preparation of EM extended.

- 4- Plastic / steel tanks, each of 2 - 5m³ capacity. The requirements depends upon the quantity of EM required for deodorization.
- 5- Plastic tanks / steel tanks to store sugarcane molasses. The quantity will have to be determined on the bases of requirement.
- 6- Transport, pickups, tankers and a jeep will be needed to transport EM material from the manufacturing site to the application site and for the mobility of technical staff.
- 7- Labor as per requirements will be needed to perform the duties efficiently and for the application of EM material.
- 8- EM material, to start with deodorization EM products will have to be important from the Islamic Republic of Pakistan or Japan and later on the seed manufacturing unit will be installed at Abu Dhabi.
- 9- Molasses, these will have to be arrange either locally or from other countries keeping in view the cost. Molasses are the food for effective microorganisms.
- 10- Water, clean water free from pathogens is required for EM manufacturing and for the preparation of various types of EM.

For **deodorization** the EM environment (similar to EM extended) will have to be prepared under controlled conditions and temperature. Based on the previous experience at various places EM Research Organization for Middle East & Central Asia will carry out short period trials to determine the exact quantity of EM and to formulate a definite formula of EM. The application and sprinkling of EM will be made at a suitable stage of manufacturing so that the deodorization is controlled from the beginning where odor producing pathogens are present. The quantity of EM applied will not only eliminate odor completely but will also help to manufacture high quality of compost. The compost will be organic in all respects and the application of NPK with commercial fertilizer will be stopped to keep the production of compost purely organic. No extra EM will be required for high quality compost as the EM working for the deodorization will be sufficient to achieve the targets.

16.1.2. Manufacture of high quality Organic Compost

The application of EM products to the sorted out city solid waste material will reduce the odor to start with. The applied Effective Microorganisms will start their working immediately by increasing their population tremendously. The working of EM will continue during the period (2 months) of production or stages of manufacturing without any interruption. Nothing is to be done extra for EM Organic Composting except the 9 stages of manufacturing (being followed presently) are to be continued without any change. In the end of last stage of manufacturing the EM Organic Compost will be ready for packing and sale by following the existing procedure and methods.

16.2 Benefits of using EM Technology

The benefits of EM Technology are many fold and are given below:

- i) EM Technology with all its components has been declared safe in developed countries like USA, Germany, France, England, New Zealand, Australia and Brazil etc.
- ii) The application of EM Technology is helpful to control all types of pollution.
- iii) EM Technology is easy to handle and safe to apply in various fields. It is not harmful for the human beings, animals and other birds etc.
- iv) **Elimination of odor:**
The odor will be eliminated within few months after the start of the EM application. As soon as EM environment at the Compost Plant is established and deodorization is achieved. It will be certified by every body working in the Compost Plant and the residence in the surrounding of the factory. The deodorization will improved the air pollution caused by the odor. The air will be having pure oxygen for inhaling. The workers will improved their health and with that the efficiency of work will increase. This will result in higher production bringing more extra income from the Compost Plant.
- v) **Elimination of air pollution**
As soon as the odor is eliminated the problem of air pollution will automatically be controlled resulting in a pure oxygen atmosphere. The UAE countrymen will inhale natural air and not contaminated air.
- vi) **Production of high quality of Compost**
The quantity of EM to be applied to be applied for deodorization will be regulated in such a way that it will help to produced high quality compost. High quality means the compost will be rich in effective and beneficial organisms, organic matter, NPK and micronutrients. There will be no need to add extra NPK with commercial fertilizers, thus the compost will be purely organic in nature. The addition of NPK with commercial fertilizers contaminate the organic compost and it is neither organic nor inorganic.
- vii) **Reduction in the period of production of organic compost**
Presently compost is being manufactured in more than 3 months period. With the application of EM Technology not only elimination of odor will be achieved but also the production period of compost (organic compost) will be reduced by atleast one month, meaning thereby that the organic compost with EM will be produced / manufactured within 6 to 8 weeks period.

- viii) Economics of production of organic compost with EM**
 The application of EM will eliminate odor to start with and simultaneously will produce high quality organic compost within a period of 2 months instead of 3 months. The one month saving will have a great effect on the economics of manufacturing organic compost. The production of organic compost with the application of EM will increase by 50%, meaning thereby that the present production will increase by 50%. This will not only reduce the present production cost per unit but also earn more profit, even at the present existing sale price. The profit on export of “EM Organic Compost” will also be increased by atleast 50%.
- ix) City solid waste and compost production ratio**
 With the reduction of manufacturing period at the Compost Plant with EM Technology more quantity of city solid waste will be consumed / cured at the Compost Plant, meaning thereby that more quantity of city solid waste (atleast 50% more compare to the present curing) will be utilized in 8 weeks period. Thus, the ratio of utilization of city solid waste and production of EM Organic Compost will increase by 50%.
- x) Export of EM Compost**
 Once EM Compost is recognized and certified by the respective authorities that the EM compost made in Abu Dhabi UAE is organic compost it can be exported even to developed countries at a higher price as purely organic compost brings higher price in such countries. Presently crops and vegetables grown under organic farming brings double the price as compared to commercial fertilizer grown crops and vegetables in these countries. This will certainly increase the income of the respective Compost Plant.
- xi) Cost effectiveness.**
 There is no substitute of pure atmosphere. The men have polluted air by the exhaust of motor vehicles, factories exhaust and burning smoke giving material. The men have played the role to contaminate water and land. The contamination of air, water and land have played an havoc. To improve contaminated air, water and land with extreme quantities of exhaust, effluents and sewage water and various types of sludges from petroleum and other industries is very difficult but the invention and development of EM Technology has made it possible to improve the contaminated air, water and land to such an extent that the standards fixed by various environmental agencies / organizations can be met. This means that the contaminated source can be converted into a useful resource.
- xii) Monopoly of UAE in EM Technology for Organic Composting**
 UAE will be the first country amongst Arabs using EM Technology for making pure “EM Organic Compost”. The UAE personnel will be disseminating technical knowledge relating to EM Organic Composting to their Arab brothers. It will be a great honor for UAE to

serve humanity in the production of EM Organic Compost to be used in the field of agriculture, horticulture and floriculture, and in the field of environment protection. The use of EM Organic Compost will eliminate all the diseases being caused by excessive use of commercial fertilizers. In developed countries like USA, Japan, England, Germany, New Zealand and Brazil etc the general population is paying double the price on the purchase of crops and vegetables produced with organic farming, just because of getting benefits on health.

17. Cost evaluation

It has been mention under the benefits of using EM Technology in manufacturing EM Organic Compost that the period of production of a lot will be reduce to 2 months. Presently a lot of Organic Compost is being produced in a period of 3 months. This reduction in the manufacturing period will enhance the total production of the Compost Plant by 50%, meaning thereby that the present production of a year will be increase by 50%. A production of 32 500 tons of Organic Compost in the year 2000 is given at page 28 of the publication named “United Arab Emirates, Abu Dhabi Municipality, Abu Dhabi Compost Plant”. Using EM Technology this production will increase by 50%, thus it will be 48 750 tons in a year.

Further at page 38 of the same publication mentioned above the rate of compost sale price for citizen is given. For the sake of example Al Hzera compost in bags is sold at the rate of 550 Dhs. The price of 32 500 tons compost comes to 17,875,000 Dhs, whereas the price of EM Organic Compost comes to 26,812,500 Dhs. The difference between the two prices comes to 8,937,500 Dhs, meaning thereby that this amount is the result of using EM for the deodorization and manufacturing of EM Organic Compost within a year. This amount of 8,937,500 Dhs is a profit to the management of Compost Plant. If converted into US \$ it will be 2,979,166. Is this not worth concentration?

18. Conclusion

The EM Technology is not very expensive. The magic of EM is to make the useless and waste resource into a useful and beneficial resource. All types of bad waters (industrial effluent, sewage water, oily sludge of petroleum industry and solid wastes of other industries and city solid wastes) EM Technology is easy to apply and safe to handle. It is friendly from environmental point of view. EM Technology makes the life easy and healthy. Simply EM is the future of the world.