

EM APPLICATION FOR REHABILITATION OF TSUNAMI STRUCK AREAS

January 18, 2005

Introduction:

The earthquake and the ensuing tsunami that struck several countries around the Indian Ocean on Dec. 26, 2004 have left more than 150,000 people dead and missing. As rescue and rehabilitation operations continue, there are several problems that need to be addressed. Among these are foul odor remediation and infectious disease control due to rotting corpses as well as the lack of safe drinking water and salinity in the soil of many inland areas struck by the tsunami.

In line with these issues, herewith are some practical suggestions for the application of EM Technology for the rescue and remediation efforts in the disaster struck areas. It must be noted that these are temporary measures.

1. Salinity control

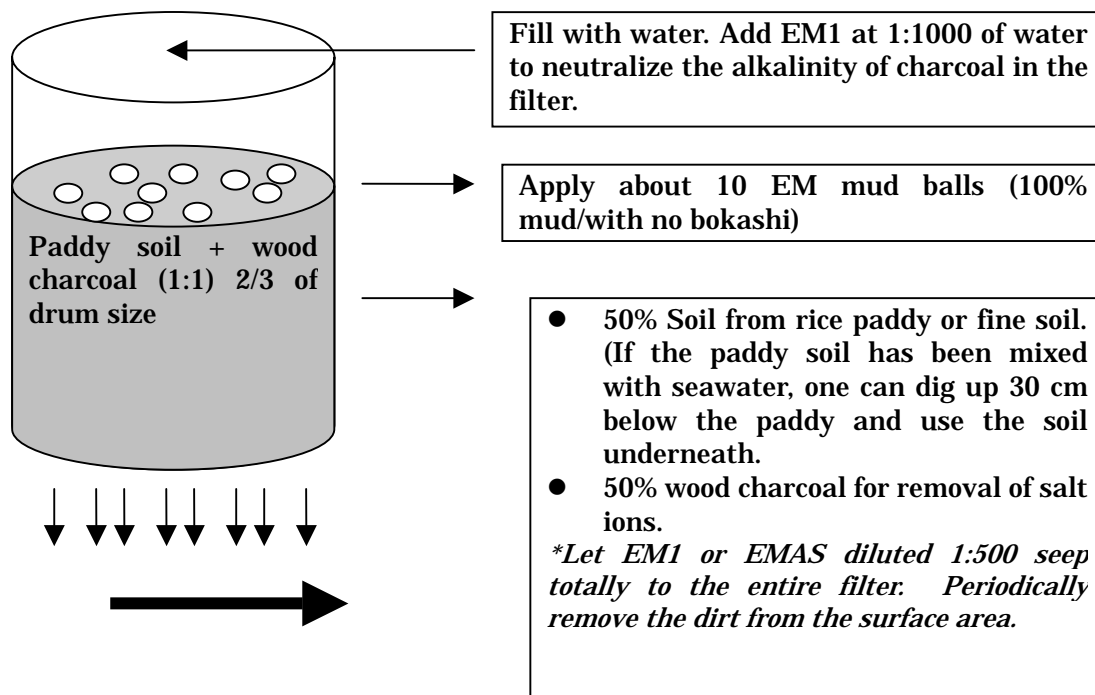
As the waves swept inland, many freshwater sources and soil areas have been mixed with the water from the ocean. This has left many farms such as rice paddies or shrimp ponds with extreme salinity. In order to reduce the salinity of the food production areas, the following are suggested.

- A. **Spray with EM Activated Solution:** The EM microbes can absorb and store in their bodies the minerals brought in by the seawater and kept in the soil. The minimum recommended application is EM Activated Solution diluted 1,000 times sprayed at 1 L/m² at least once a week. If possible, it is also recommended to spread bokashi to the food production point (that is, farms or garden plots) to help the EM and other local beneficial microbes increase in the area and hence reduce more quickly the salinity in the soil.
- B. **For rice paddies and shrimp ponds**
 - a. Apply bokashi as suggested in the APNAN guidelines for land preparation
 - b. Plant rice. This crop has a high salinity absorbing capability. It is expected that one cycle can help decrease significantly the salinity in the soil.
 - c. Change water regularly as the usual practice in growing rice.
 - d. In the case of areas where there is no water (as in a paddy), wheat, barley, etc. can be planted since these crops have high salinity absorbing capability.
- C. **Other crops:** watermelons and melons could be planted. Application of bokashi as suggested in the APNAN guidelines should be followed.

2. Foul Odor Control

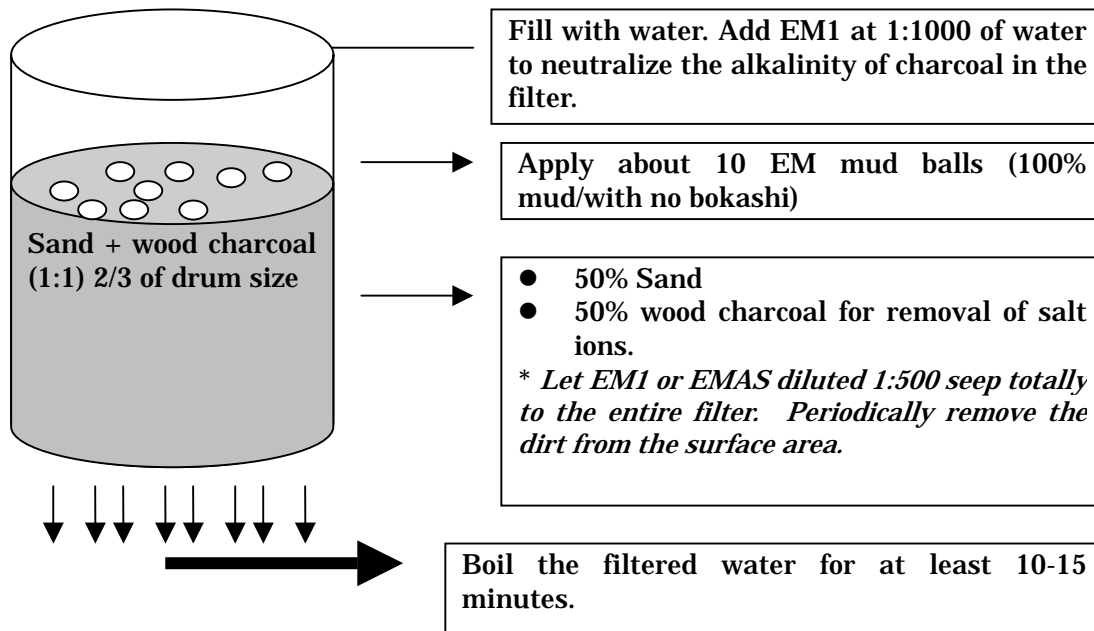
There is much foul odor emanating from the decaying bodies. Spraying of EMAS, preferably at a dilution rate of 1:30-50 is suggested. For an area in general, spraying twice a day is also recommended to help reduce the chance of the spread of infectious diseases.

3. Obtaining water for general use (not for drinking): Making a simple filter

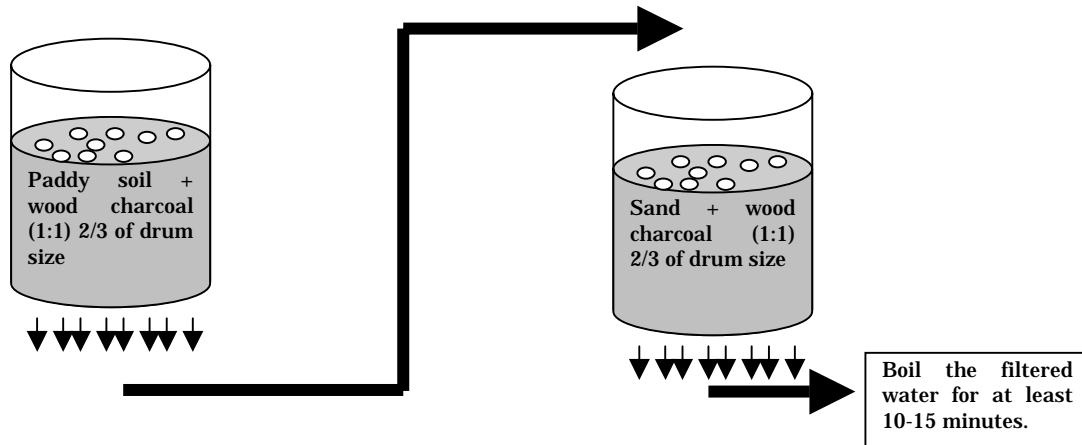


4. For drinking water:

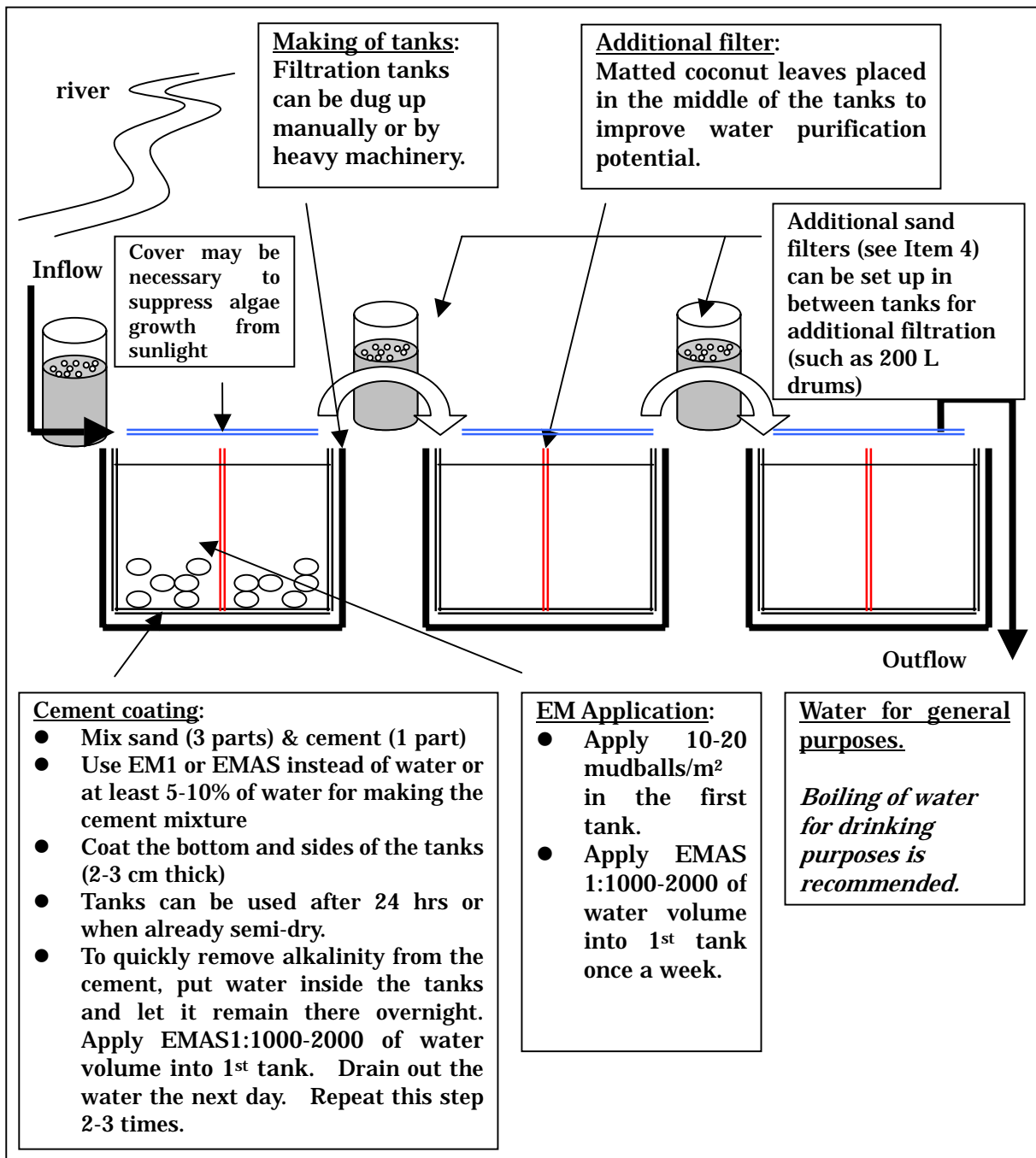
Many military engineering corps have their own drinking water conversion and treatment systems. It would be much quicker to use such systems to obtain drinking water. Commercially available treatment systems are also available, such as reverse osmosis systems with 5 filter layer systems and can only filter about 550L per day and costs about 70,000 baht per unit (in the case of Japanese brands in Japan). Nonetheless, a simple filter system can be made as follows:



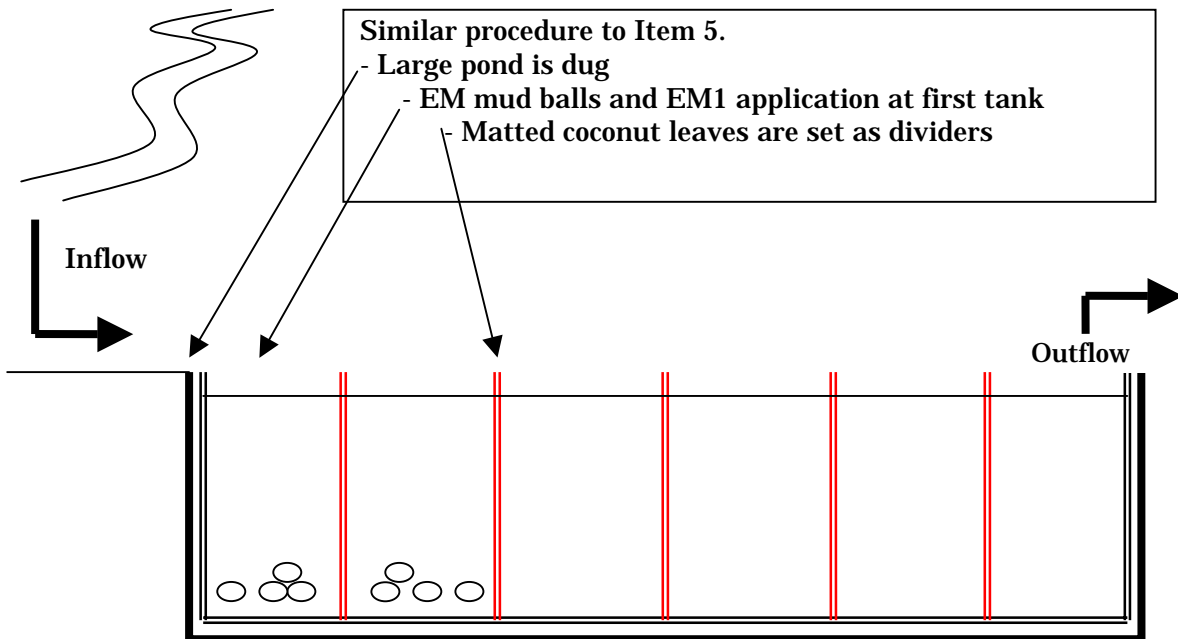
If need be, a combination of Items 3 & 4 can also be recommended:



5. Obtaining water from open water sources, such as rivers, other freshwater / brackish water sources.



6. Obtaining water from open water sources, such as rivers and other freshwater bodies (for general purposes, not for drinking).



7. For making of EMAS:

It is preferable to use clean/drinking quality water for making of the EMAS. However, in case it is difficult to obtain clean water, brackish water can be used. In the case brackish water supply is limited, brackish water (50%) and sea water (50%) can be used. The use of 100% seawater is not advised.

8. For malaria control in freshwater bodies:

It is possible for malaria and other waterborne diseases to break out from unclean freshwater sources. As countermeasure, the following are suggested:

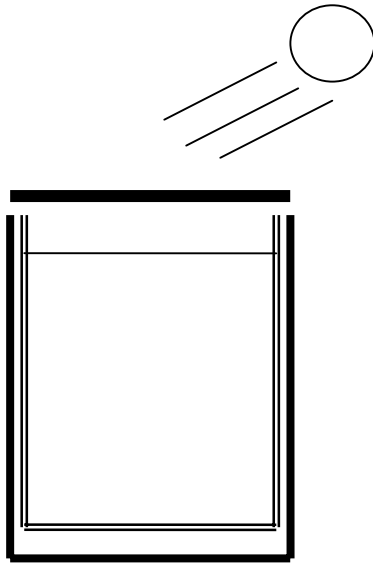
- Spray EMAS
 - Initial application: 1:2000 of water volume
 - Next applications: 1:5,000-10,000 of water volume
- Apply mud balls (not bokashi balls) into the ponds at a rate of 1 pc/m²

It is expected that mosquito incidence will decrease significantly and larvae cannot develop.

9. Others:

- Toilets: In the case of makeshift toilets, EMAS can be sprayed for foul odor control and suppression of pathogenic microbes.
- Bath/shower alternative: Mix at least 1% of EMAS or EM1 to water. Wet a hand towel and apply to the body. If 1% of EMAS is not effective, a more concentrated EMAS dilution, (up to 10%) is recommended. It must be noted too that the body of some people may initially react to the EMAS application. Itchiness, redness of the skin may be experienced. If it is too much to bear, it is recommended that the person stop this application.

10. Rainwater: Collected rainwater may be used for general purpose as well as for drinking. EM application can be as follows:



Rainwater collection tank

1. Cement / mud moistened with EMAS (100%)
2. Apply the mixture as coating on the inside parts of the tank
3. Let dry, then let water in.
4. Apply EMAS into the stored rainwater at 1:1000
5. Soak thoroughly pieces of clean sponges/cloth bath into EM1 and let these float inside the tank.
6. Take out and wash (without using soap) the sponges once a week.
7. Avoid direct sunlight to prevent algae growth.
8. Boil water for drinking.