

Case Study: 4	Waste Management Practices in a Pharmaceutical Industry
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## **Bio-Composting of Biomass Generated in Effluent Treatment Plant of an Antibiotic Bulk Drug Manufacturing Unit**

### **I. Background Information:**

One of the large bulk drug manufacturing units in the country had a problem of disposal of the biomass generated in their effluent treatment plant. The plant was collecting the biomass as sludge from their sun drying beds, in their effluent treatment section and incinerating it. The disadvantage with this system was that, the system has substantial operating costs, with practically no much value addition. The plant was aiming for "Zero Discharge" status. This necessitated the need for innovative solution to the problem of waste management.

### **II. Best Practices:**

The plant explored the possibility of utilizing the biomass sludge as soil conditioner, by "Biochemical" method of stabilization. The process involves composting of the bio-sludge using the dynamic pile process. The dynamic pile process has the advantage of modular design, enabling increase in the capacity of the composting process.



This process is a self heating process, which helps destroy the pathogens and produce material similar to soil humus. Extensive trials and studies were conducted on use of the bio-composted material as a substitute for commercial organic manure.

The effect of the compost on phyto-toxicity, plant growth and fruit yield were studied.

The comparison of the use of bio-compost with NPK vis-à-vis the use of bio-compost alone is depicted in the photographs below:



**Bio-compost 50% with NPK**



**Bio-compost 50%**

The use of compost as substitute for organic fertilizer has been very encouraging. The quality of the compost is at par with commercially available organic manure.

The plant has been able to compost about 1000 tons of biomass waste generated in the effluent treatment plant.

### **III. Benefits:**

The following benefits have been achieved by adopting the bio-composting method of waste management, in place of incineration.

- ❖ Lower operating cost

- ❖ Lower equipment cost
- ❖ Quality of compost is comparable to that of commercially available organic manure
- ❖ The compost has a quality which blends well as a soil additive
- ❖ The technology is cost effective and eco-friendly
- ❖ The cost economics of the bio-composting technology compared to the incineration technology is highlighted below:

Benefits	Incineration	Bio-composting
Cost (Rs./ton)	24000	1000
Environmental impact	Emission of green house gases	Improves soil condition
Benefit to society		Decentralized rural employment opportunity