

Value-added waste products

The generation of various kinds of solid wastes pose a serious threat to the environment. On one side the amount of waste generated is increasing due to population explosion, but on the other side, waste disposal sites are getting reduced due to non-availability of land. The only method for safe disposal, is converting these solid wastes into value-added products. Some of the latest developments in the field of wealth-from-waste are as follows.

Edible plastics: Scientists at Argonne National Laboratory, the United States, mixed whey and waste potatoes and transformed them into a glucose syrup using enzyme action. This is fermented to give a lactic acid soup, which is evaporated until it releases all the water in it, leaving behind molecules of polylactic acid which can be formed into films and coatings. Industrial-scale production is expected to begin with Echo-Chem (a joint venture of DuPont and ConAgra) and Cargill competing for the market.

Compost from garbage: This is a relatively old method of converting segregated municipal garbage, with the help of either microbes or with cow dung slurry, into compost. Composting is based on the principle that nothing ever really disappears but just changes shape and takes new forms. The compost is high in nitrogen and carbon, and looks just like soil. It is an excellent medium for growing plants. In addition to being clean, safe and thrifty, composting can also significantly reduce the amount of garbage.

Countering rubber waste: Microbiologists at Richland Facility in the United States Department of Energy's Pacific North-West Laboratories, are training sulphur-loving micro-organisms to eat up the sulphur used in tyres. The bacteria (generally *Rhodococcus* and *Thiobacillus*) attack the sulphur, that bonds the basic polymers together, and leave the carbon backbone intact for reuse. Best of all, the particles of rubber left still have the physical properties of rubber and can be recycled easily.

Fuel from kitchen waste: Scientists at the Korea Institute of Energy Research (KIER) have invented a waste digestion system for transforming food residues. This system maximizes the energy recovery rate and minimizes possible damages to the environment, by handling liquid and solid wastes separately. It has been noted that 35 l of pure methane gas and 10 kg of quality fertilizers can be obtained from 100 kg of kitchen waste by using the two-phase digestion system. The methane gas can be used to provide heating service to households and also to produce electric power.

Cattle feed from waste food and waste paper mixture: Illinois State University, the United States, has begun a project to evaluate the feasibility of converting food waste and waste newspaper into cattle feed and as a soil supplement. The technique involves first pulping the food waste from a college cafeteria and then mixing it with ground waste paper – to make it appealing to the cows. The pulped food and paper will be composted together in the second part of the project to make a soil amendment. Using the waste in its pulped form is expected to speed-up the composting process while reducing production costs. (Green Business Opportunities, January-March 2000)