

# Rapo-Compost Technology: Option for Bio-Waste Recycling

Asha Sahu\*, M C Manna, S Bhattacharjya, J K Thakur, A Mandal, K Bharati, SR Mohanty, ICAR- Indian Institute of Soil Science, Bhopal, India, \*Corresponding Author: asha.sahu@icar.gov.in; ashaars.iiss@gmail.com

## Salient Features

- A new technology has been developed to speed up the compost time using consortium of lignocellulolytic thermophilic bacteria, fungi and actinomycetes
- For this purpose, rapo-compost machine is designed
- Wastes materials like crop residues, farm wastes, animal feed wastes, vegetable wastes and city wastes are collected
- Fresh cow-dung is mixed with the waste materials
- Inoculation with lignocellulolytic thermophilic microbes
- Moisture content is maintained throughout the composting period at 60% of water holding capacity
- Periodic turning is done to provide aeration

## Ingredients Required

For the preparation of 1 ton compost, 1.5 ton fresh biomass (waste material), 500 kg fresh cowdung, 11 kg Urea, 500 g fungal inoculum ( $10^5$  viable cell), 10 litre bacterial ( $10^8$  viable cell), and 10 litre actinomycetes ( $10^8$  viable cell), inoculum are required

## Impact And Benefits

- ✓ RAPO-COMPOST would prepare compost within 1-1.5 months from domestic and vegetable waste
- ✓ The manurial value improved such as total nitrogen 1.5 to 2.3 %, total phosphorus 0.5 %  $P_2O_5$
- ✓ Large quantities of wastes materials may be recycled back to the field after converting them to quality manure
- ✓ The production of a valuable soil amendment from many organic materials which normally might be wasted
- ✓ Rapid composting kills all plant disease producing organisms
- ✓ Insects do not survive at high temperature during the composting process
- ✓ Most weeds and weed seeds are killed

## Step 1- Collection of wastes and Segregation



## Step 2- Mixing wastes and fresh cowdung



## Step 3- Inoculation with the consortium of organisms



## Step 4- Mixing of consortium with wastes and cowdung mixture and putting whole mixture into the Rapo-compost machine

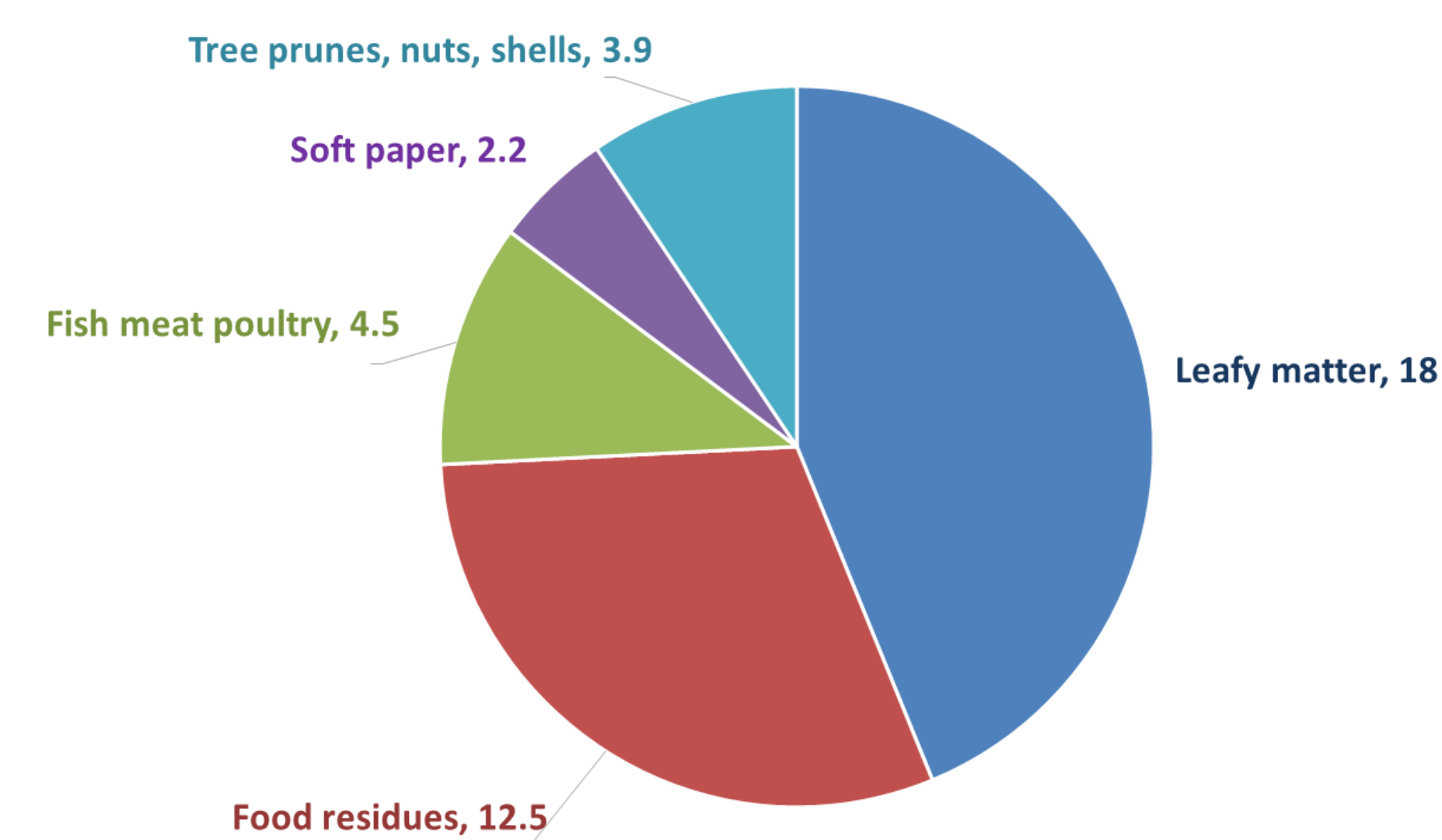


## Step 5- View of Rapocompost



- Rapid population growth with increasing urbanization and living standards, due to technological innovations have contributed to an increase, both in the quantity and variety of solid wastes generated by industrial, mining, domestic and agricultural activities
- Current global MSW generation levels are approximately 1.3 billion tonnes per year, and are expected to increase to approximately 2.2 billion tonnes per year by 2025. This represents a significant increase in per capita waste generation rates, from 1.2 to 1.42 kg per person per day in the next fifteen years.
- In the next 12 years alone, South Asia — and “mainly India” — will be the fastest growing region for waste generation, says a paper published Oct 3, 2013 in *Nature*.
- MSW generation levels are expected to double by 2025.
- Therefore, rapid composting is the need of the hour for reducing the time required for obtaining good quality compost from 6 months to 1-1.5 months

## Composition of Biodegradable Waste (%)



Biodegradable Wastes	Available quantity (Mt)
Crop residues waste	679.3 Mt
Horticultural and plantation crop waste	134 Mt
Animal dung	369.5 Mt
Urban solid waste	64.8 Mt

## Stages of Composting

