SOLID WASTE MANAGEMENT IN TRIVANDRUM

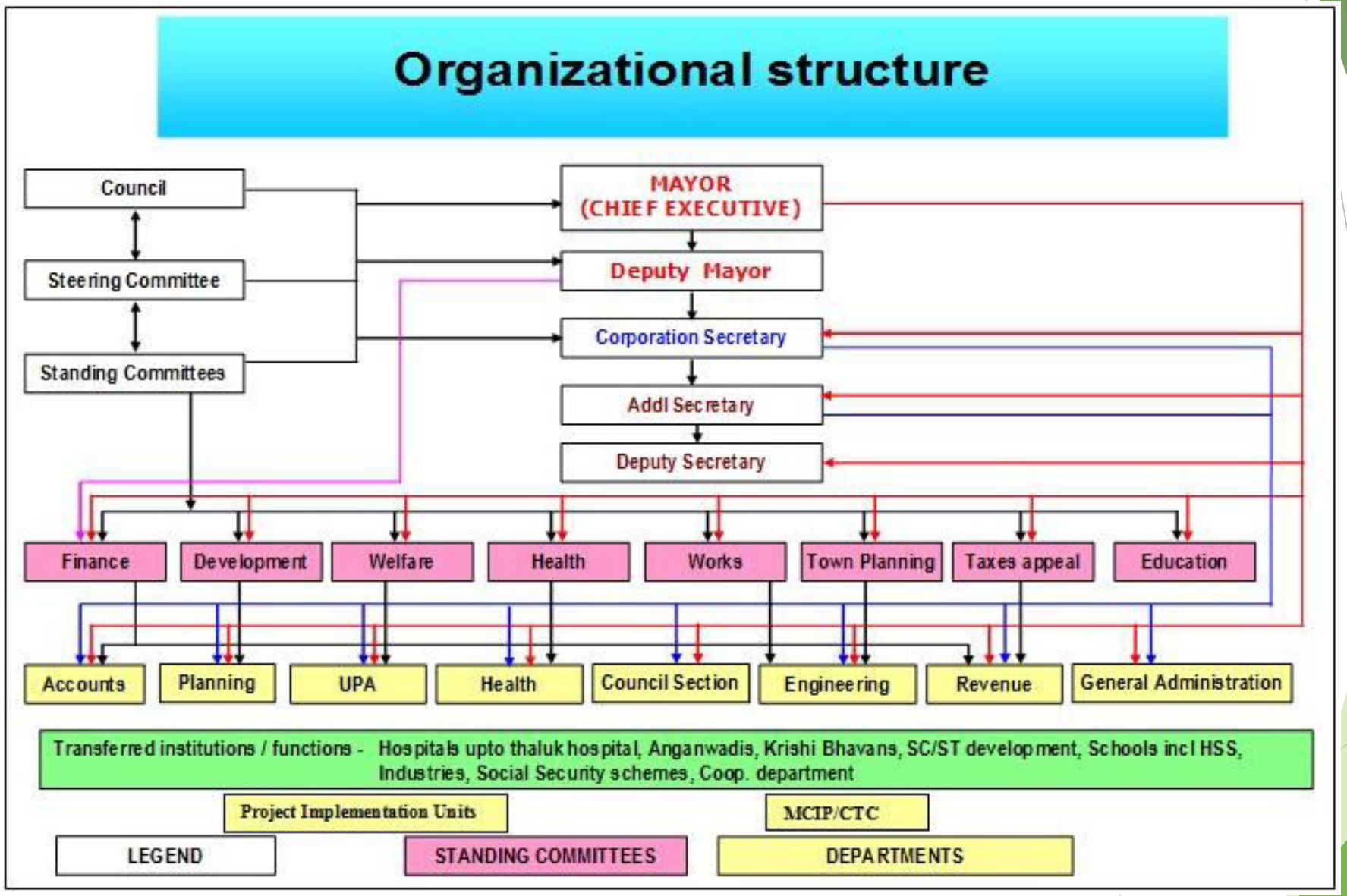
HONORABLE MAYOR WITH GREEN ARMY VOLUNTEERS

Administration Wing

THIRUVANANTHAPURM MUNICIPAL CORPORATION -HEALTH WING

- HONORABLE MAYOR
- HONORABLE HEALTH STANDING COMMITTEE CHAIRMAN
- SECRETARY
- CORPORATION HEALTH OFFICER
- HEALTH SUPERVISOR-3
- HEALTH INSPECTORS-26
- JUNIOR HEALTH INSPECTOR -96
- AMW-77
- JPHN-37
- CONTIGENT WORKERS-1284

Organizational structure



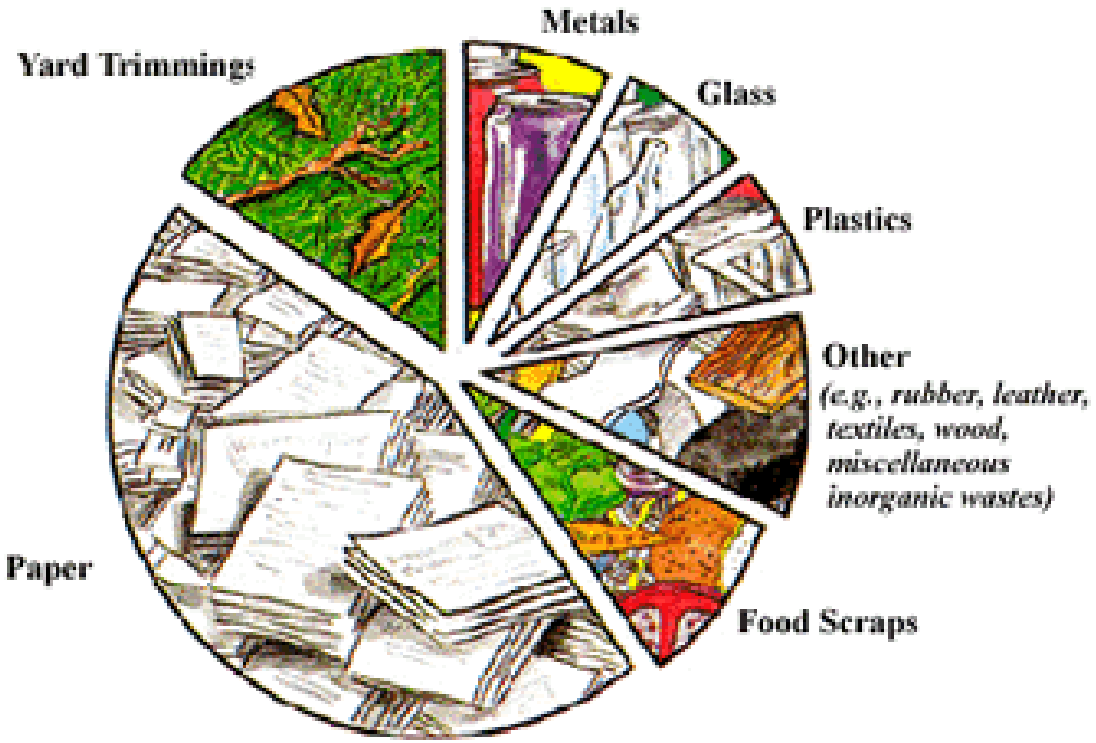
WASTE MANAGEMENT RULES

- G.S.R. 320 (E) [18-03-2016] : Plastic Waste Management Rules 2016
- G.S.R. 338 (E) [23-03-2016] : e-waste (Management) Rules, 2016
- G.S.R. 343(E). [28-03-2016] : Bio-Medical Waste Management Rules,2016
- G.S.R. 317(E). [29-03-2016] : Construction and Demolition Waste Management Rules, 2016
- G.S.R. 395(E). [04-04-2016] : Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- **S.O. 1357(E). [08-04-2016] : Solid Waste Management Rules, 2016**

MSW Generation Rate

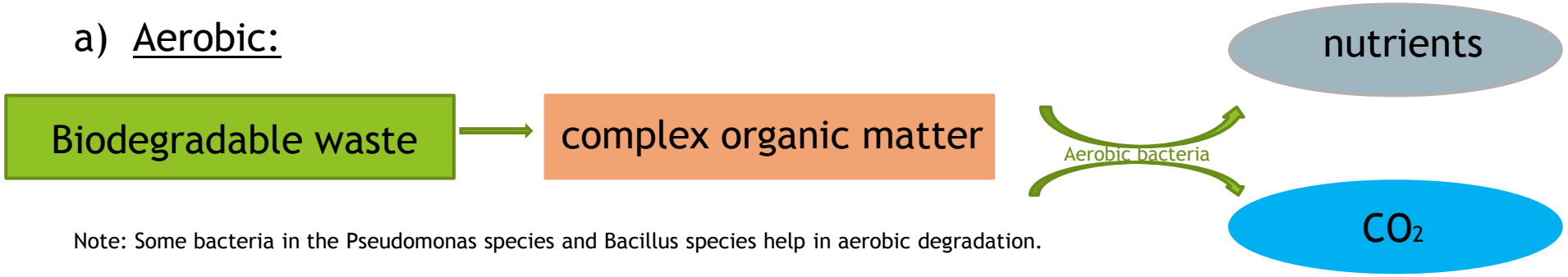
- Waste generation rate in Thiruvananthapuram ranges between 300 TONS/day
- 60% - 70% biodegradable waste.
- Population – 10,000,00 (Ten Lakhs)
- No of Households – 3LAKH
- 215 SQ KM

MUNICIPAL SOLID WASTE COMPOSITION



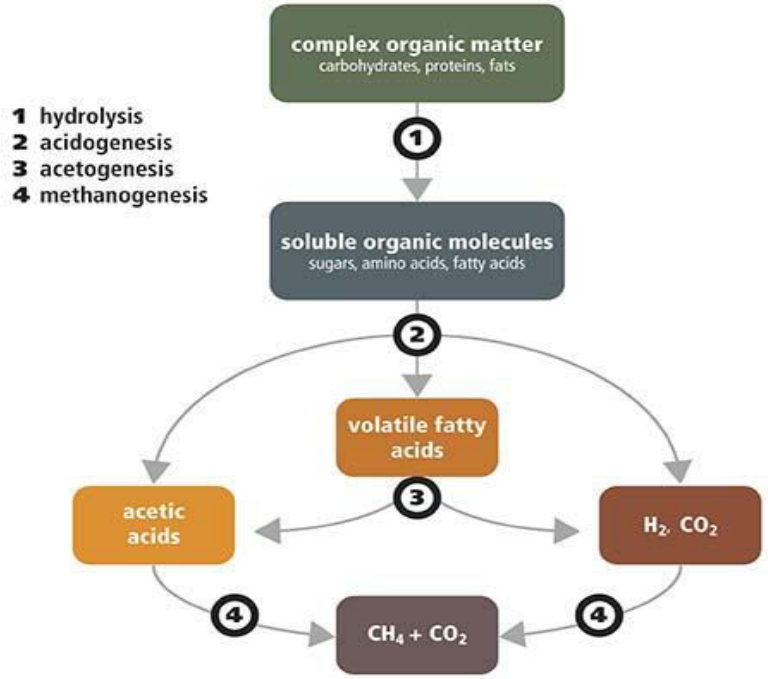
SOLUTION FOR BIODEGRADABLE WASTE

a) Aerobic:



Note: Some bacteria in the Pseudomonas species and Bacillus species help in aerobic degradation.

b) Anaerobic:



Note: Some bacteria in the Clostridium species, Streptococcus species help in anaerobic degradation.

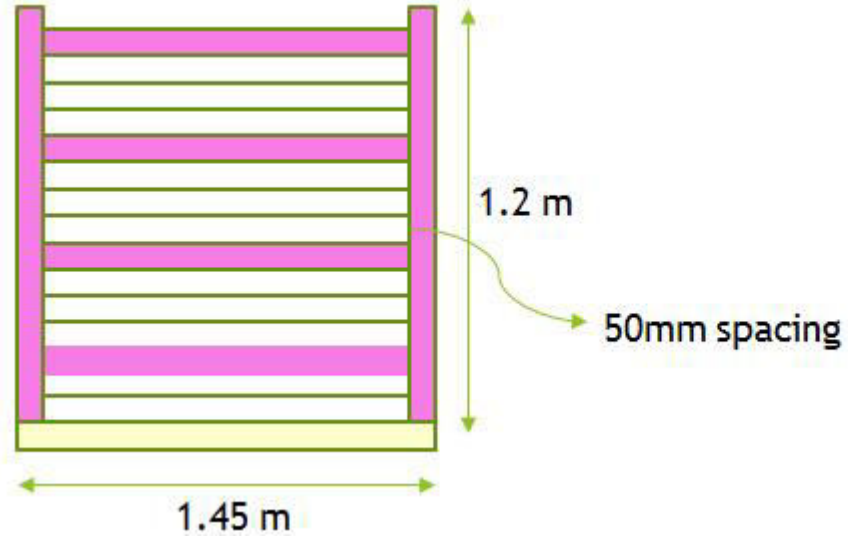
Solid Waste Management methods adapted in Thiruvananthapuram-100%DECENTALISE METHOD

CENTRALISED PLANT

- SHUDDED DOWN ON 2013

Technical specifications of Aerobic bin

- Size – 1.45m x 1.45m x 1.2m (L x B x H)
- Leachate pipe 110mm diameter
- Slurry tank chamber size 45 x 45 x 45cm
- Composting period: 90 days.
- As per DSR 2016 a shed with 5bins with beautification cost around approx. 8 lakhs (normal ground)



Manhole provided for leachate pipe

Aerobic bin at Karamana

Before

Present

Aerobic Composting method

Portable Aerobic Bin

Capacity is same as that of fixed aerobic bin.

These are placed where a temporary arrangement is to be provided for solid waste management.

Watertight roofs are provided to prevent rain water from entering the bin.

Provision given to collect leachate.

What is aerobic bin composting unit ?

- The composting unit includes a box like structure with Ferro cement floor, provided with maximum openings for air circulation, leachate pipes provided at the bottom of individual bins collected in leachate chamber.
- Layers of cow dung/inoculum, carbon source and waste materials are subjected to composting in presence of oxygen.
- The temperature rises almost 70˚C, the peak temperature, creates a lot of heat; killing all sorts of seeds and pathogens.
- No foul smell
- An aerobic compost bin reduces the biomass to usable compost quicker than its anaerobic counterpart

Factors affecting Aerobic composting

- Microorganisms
- Shredding of refuse
- C/N ratio
- Temperature
- Moisture content
- Aeration/turning

WASTE MANAGEMENT METHODS-SWM AEROBIC BIOCOMPOSTER-TOTAL NUBER OF ADOPTED HOUSES-8500

Pipe composting unit-87000 HOUSE HOLD

- PVC pipes 200mm size, 1m long.
- Pipe is erected vertically inside a pit.
- Sufficient vents to be provided to carry out aerobic action
- Mechanism activated using external source like coir-pith or cow dung etc.
- Biodegradable waste laid on top of it.
- Mixing would prevent anaerobic action completely.
- Lead to failure due to some unexpected issues.

Total No of Pipe compost installed in individual households: 87000

Kitchen bin composting unit

- Capacity - 25 litres plastic bin, and plastic grow bags are used
- Initially starter material (initiating mechanism) is placed in the bag and further biodegradable solid waste.

Biogas Plants –INDIVIDUAL HOUSEHOLD

Total no of biogas plants installed : 1800
SUBSIDY-50%OF TOTAL COST,MAXIMUM 5000 RUPEES
CAPACITY -.5M3

Community Biogas plants

- No of Biogas plants installed:56

PLASTIC WASTE SHREDDING UNIT-TO SHRED THE PLASTICS

- NO OF SHREDDING MACHINES -2
- NO OF BAILING UNIT-2
- SHREDDED PLASTICS HAND OVER TO CLEEN KERALA COMPANY
- INCOME-18 RS/KG

RRC unit at Muttathara

Dust remover

Shredding unit

- The two Shredding units at Muttathara

COLLECTION OF GLASS,BAG,CHAPPELS,E-WASTE,

- EVERY THREE MONTHS
- HAND OVER TO AUTHORISED RECYCLING UNIT

FINE COLLECTED FOR LITTERING

- 17,50000 SINCE 2014
- WASTE LITTERING IN THE PUBLIC PLACE AND IN THE WATER BODY
- 24*7 SQUAD ENGAGED IN THE DUTY

GREEN ARMY VOLUNTEERS ENGAGED IN THE SEGREGATION TO FIND OUT PLASTC WASTE PRODUCER

- Bailing machine at Muttathara

- Specification of the Shredding machine

Size of the machine	150 x 150 x 75 cm
Capacity	1 ton/day (100Kg/hour)
No of Blades	5
Power	20HP

- Specification of the Bailing machine

Chamber size	900 x 450 x 450 mm
Bale size	450 x 450 x 450 mm
Bale weight	50 to 75 Kg
Motor	7.5 HP

- Shredded plastic stocked in sacks

- Clean Kerala company collects the clean plastic of the premises at a specified rate and after shredding, use it for road works.
- Apart from the shredding unit we have MRF at various places of Trivandrum.

KITCHEN WASTE ?

Why not go for composting???

SEGREGATION AND COLLECTION AT 37 AEROBIC BINS POINTS

- SOURSE LEVEL
- COLLECTION POINTS-37 AEROBIC BINS
- NO DOOR TO COLLECTION
- WASTE COLLECTION TIME(DEGRADABLE)-5AM TO 9PM
- WASTE COLLECTION TIME(NON DEGRADABLE)-5AM TO 9PM
- FREE OF COST

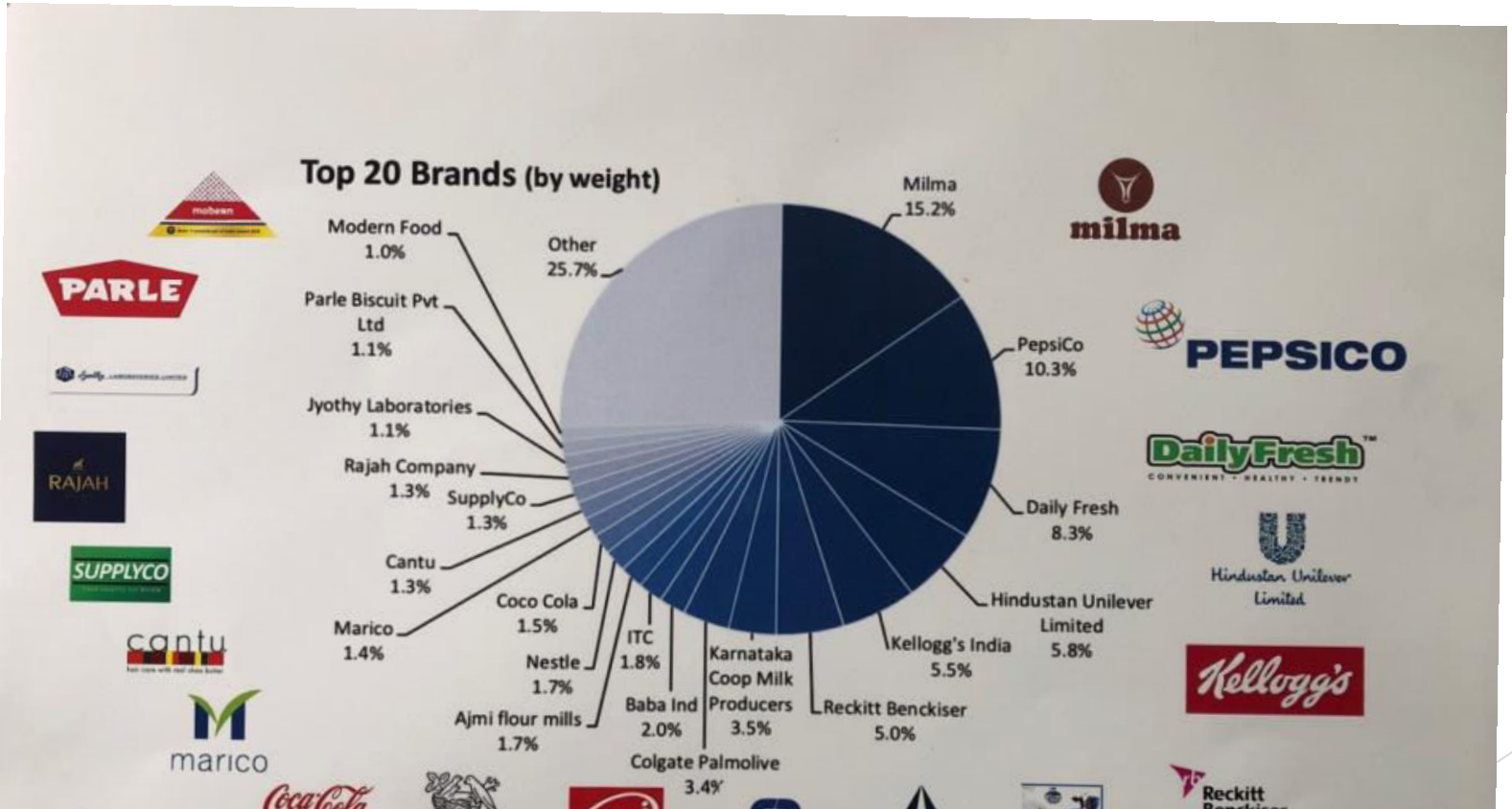
CAMPAIGN FOR SEGREGATION-BY CYCLING

PUBLIC PARTICIPATION IN THE AWARNESS CAMPAIGN REGARDING SEGREEGATION

BY MAGIC SHOW

EPR ACT-EXTENDED PRODUCER RESPONSIBILITY -IMPLEMENTED IN THE IND VS NZ MATCH AT TRIVANDRUM

- PRODUCER COLLECTED THE PLASTIC BOTTLE AFTER GETTING STRICT DIRECTION FROM THE CORPORATION
- THEY HAVE COLLECTED NEARLY 30LOADS OF BOTTLE AND HANDED OVER TO RECYCLING
- FIRST TIME IN INDIA


Top 20 Brands (by weight)
Milma 15.2%
PepsiCo 10.3%
Daily Fresh 8.3%
Hindustan Unilever Limited 5.8%
Kellogg's India 5.5%
Reckitt Benckiser 5.0%
Colgate Palmolive 3.4%
Karnataka Coop Milk Producers 3.5%
Baba Ind 2.0%
ITC 1.8%
Nestle 1.7%
Ajmi flour mills 1.7%
Coco Cola 1.5%
Marico 1.4%
Cantu 1.3%
SupplyCo 1.3%
Rajah Company 1.3%
Jyothy Laboratories 1.1%
Parle Biscuit Pvt Ltd 1.1%
Modern Food 1.0%
Other 25.7%
milma
PEPSICO
DailyFresh
Hindustan Unilever Limited
Kellogg's
Reckitt
PARLE
RAJAH
SUPPLYCO
cantu
marico