Best Practices in Udupi –Solid Waste Management

- **About Udupi**
- **Total number of taluks: 7**
- **Total Number of Grama Panchayaths: 155**
- **Total Number of villages: 247**
- **Total length of costal belt: 98 KM**
- **Total number of households: 2,47,189**
- **Literacy rate of the district (rural in 2011): 83%**

Solid Waste Management Journey of Udupi

* Under **SBM(G)** Udupi district holds the distinction of being the **first district in the state** to proclaim the whole district as **Open Defecation Free.**

* During the 2017-18 financial year, **Udupi was ranked top in the Swachhata Darpan** rating by the Ministry of DWS.

* The district adopted the idea that changing people's attitudes regarding waste is the first step toward solving the garbage problem.

* Udupi district has the credit for launching first SLWM centre in Karnataka way back in 2017.

* Udupi District introduced the concept of converting **waste into resources.**

* Waste disposal process has been transformed into a **economic activity with the help of SHG members**

•At present all Gram Panchayaths focusing on dry waste collection and its scientific disposal.

•Only in peri-urban GPs wherever necessary wet waste collected.

SLRM Model (Solid and Liquid Resource Model)

- Waste Collection Center has been set up in each Gram Panchayat.
- Each SLRM/SWM Center would have one collection vehicle, supervisor and 4-6 workers.
- Primary segregation of waste into dry, wet and hazardous at household level.
- Dry waste collected from households & commercials were sorted into multiple different categories & the recovered materials were sold to local dealers.
- User fee has been collected from houses & commercials for the purpose of operational cost of the SWM unit, as per the bylaw adopted by Gram Panchayath

Wet waste management

- Home composting was promoted
- At community level it is managed at SLRM units

Accomplishments of SLRM(SLWM)

- All 155 Gram Panchayats in Udupi have initiated segregated waste collection.
- Introduced the state's first self-sustaining waste management model through SHG's.
- Created employment opportunity to nearly 600 rural women.
- Creating a reliable garbage collecting system in rural areas.
- Managing the waste generated in the village successfully

Challenges of SLRM

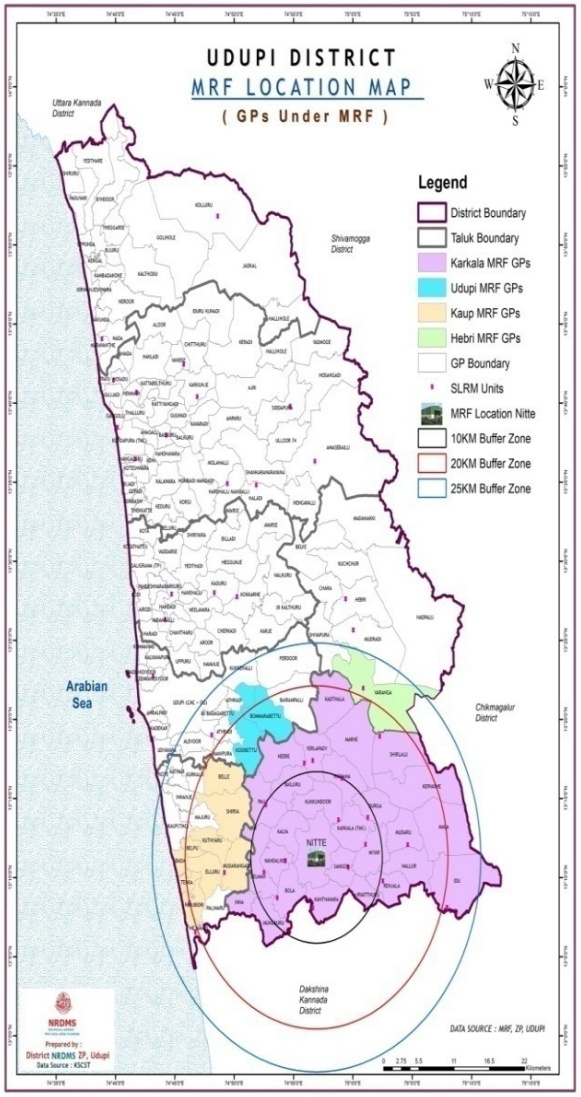
- Low sorting efficiency 30 to 40 kg per person per day.
- Only high value recyclable items were sold.
- Scrap dealers offered low rates for recyclable materials
- Not enough space to store materials for long period.
- Not much options to dispatch non recyclables & low value items

First MRF in rural Karnataka

Nitte MRF Youtube link:

https://youtu.be/7hjEvr71zZk

GP's covered under MRF



Sl.no	Talukas	Grama Panchayat	Sl.no	Talukas	Grama Panchayat
1	Karkala	Hirgana	22	Karkala	Mudaru
2		Kadthala	23		Nallur
3		Bola	24		Edu
4		Kanthavara	25		Miyar
5		Nitte	26		Renjala
6		Nandalike	27		Irvathuru
7		Inna	28	Kaup	Shirva
8		Belman	29		Kuthyar
9		Mundkoor	30		Mudarangadi
10		Kalya	31		Yellur
11		Palli	32		Belapu
12		Durga	33		Bada
13		Kukkundoor	34		Tenka
14		Sanoor	35		Padubidri
15		Neere	36		Palimar
16		Bailoor	37		Belle
17		Yerlapdi	38		Hejamadi
18		Shirlal	39	Udupi	Athradi
19		Marne	40		Bommarabettu
20		Mala	41		Kodibettu
21		Kervashe	42	Hebri	Varanga

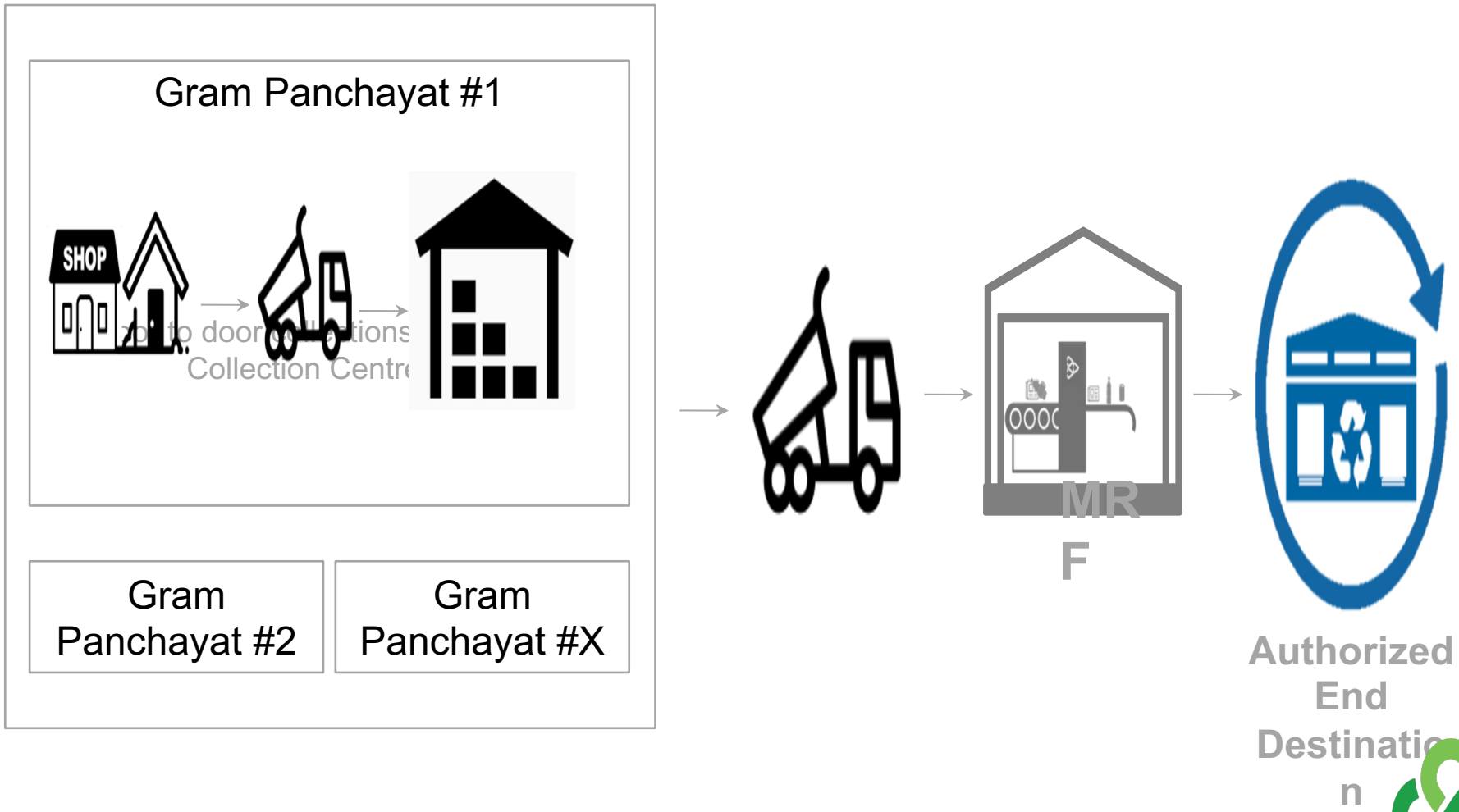
S.N	Particulars	Details
1	Number of Gram Panchayats covered	42
2	Per Capita waste generation	40grams
3	Number of households in the mapped G.P's	75,730 units
4	Number of Commercial establishments in mapped G.P's	6,030 units
5	Total dry waste generated from HHs and commercials in the mapped GP's	9,985 Kg
6	Present Population	2,55,336

Overview of MRF

* Located in 2 acres of land in Padavu of Nitte village, Karkala Taluk
* It has the capacity of segregation of 10TPD
* Its area is 10,000 square feet
* Equipped with 3 conveyor belts(shop floor, inclined and mezannine floor) and baler machine, weighbridge, 7ton capacity vehicle
* Dry waste from 42 Panchayaths are segregated into 25-30 categories
* Around 25 staffs working here in 2 shifts

150-200 Kg per staff per shift

MRF Process Flow



MRF added Value to Waste

Every bit of collected dry waste command higher price. (PET bottles get Rs 18 per KG under present system, bailed pet bottles get above 45 Rs per KG)

*Disposal of waste to the authorised and final recycling Center.

•Utilization of less human resources. It increases the efficiency of work force and reduce the labor and time involved in the process.

•In Conveyor belt, one worker can segregate up to 150 kg dry waste per shift as against 30 kg in SLRM centre.

•Less space is enough to keep the baled/compressed items. In SLRM nonbailed items occupy larger space.

*MRF ensures that every bit of waste collected including non recyclable is scientifically disposed.

*Non reusable waste is transported to cement factories for the purpose of co-processing.

*Transparency can be achieved in the waste quantification, income and expenditure of SLRM.

*Digitalization resulted in proper maintenance of waste collection record, vehicle movement, quantification, recycled , dispatched, income, expenditure details. Therefore monitoring is easy

MRF Capex

Sl. No.	Particular	Amount
1	Civil Infra Structure (PEB structure including office, kitchen, toilets)	155 Lakhs
2	Machinery and equipment (Processing, Material handling & other equipment's, Truck, weighbridge)	95 Lakhs
3	Road construction & other expenses	10 Lakhs
	Total	**260 Lakhs**

Implementation Stages

5. MRF Operations

- Training the Entrepreneur.
- Handholding in operation

4. MRF Construction

- Tendering of MRF shed.
- Equipment's BOQ & Tendering
- Commissioning of machinery.

3. Capacity building

- Optimization of collection infrastructure.
- Awareness activities, IEC .

2. Detailed Project Report

- Data collection.
- Defining of capex, opex.
- Preparing detailed estimate.

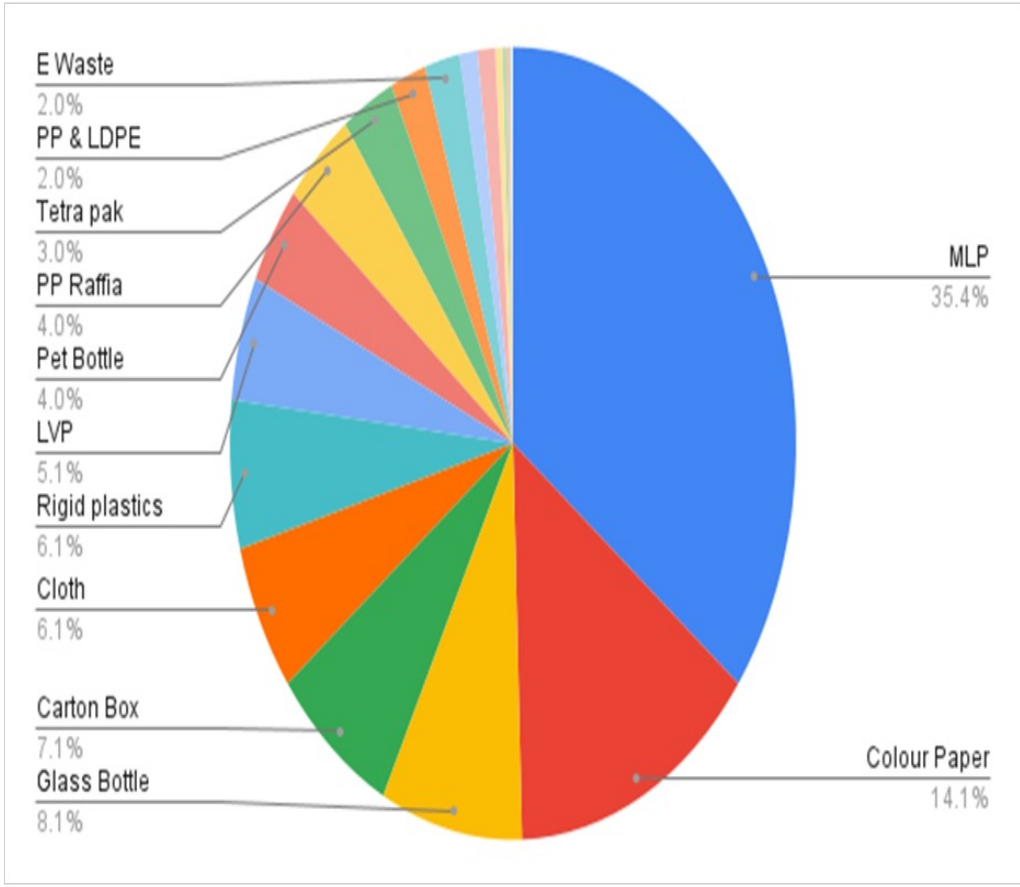
1. Survey & Planning

- Identification of land, verification and approval in all land documents for SWM
- Mapping of GP's , waste quantification.

MRF Operator Selection

- Material Recovery Facility is a permanent project and is entrusted to Managala Resource Management(Start up of Ramakrishna Mission, Managlore) for 3 years.
- Managla Resource Management Private Limited was a successful bidder in the tender(Expression of Interest) called for the operating of Material Recovery Facility in May, 2021.
- Managla Resource Management quoted lowest service fee and emerged as successful bidder.
- A year after commissioning of project, service fee is revised and operator collecting only transportation cost from GPs which is nominal.

MRF waste characterisation



Sl. No.	Item	Percentage obtained (%)
1	MLP	35%
2	Color Paper	14%
3	Glass Bottle	8%
4	Carton Box	7%
5	Cloth	6%
6	Rigid plastics	6%
7	LVP	5%
8	Pet Bottle	4%
9	PP Raffia	4%
10	Tetra pak	3%
11	PP & LDPE	2%
12	E Waste	2%
13	Books	1%
14	MS Metal	1%
15	Thermocol	0.4%
16	Footwear	0.2%
17	Coconut shell	0.2%
18	Pet Brown/ kadak	0.1%
19	Aluminum Tin	0.1%
Total		**100%**

Details of MRF Waste Management from August 2021-December 2022

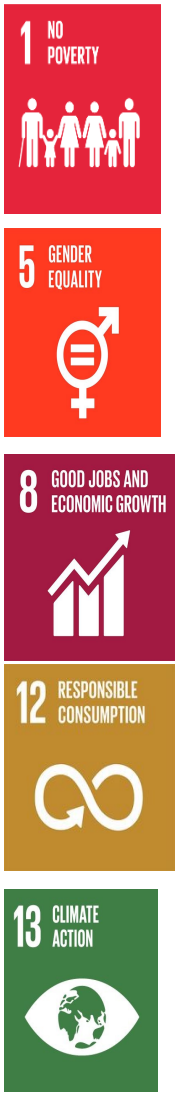
	From August 2021-July 2022(one year)	August 2022-December2022
Quantity of Waste(Materials Inward)	1056 Ton	644.64 Ton
Materials Segregated	1018 Ton	628.46Ton
Materials Dispatched	906.43 Ton	695.75 Ton

	From August 2021-July 2022(One year)	August 2022-December2022
Income from Sale of Waste	84.86 Lakhs	47.65 Lakhs
Revenue from User fee	36.04Lakhs	16.56 Lakhs
Total Revenue	121.64 Lakhs	64.21 Lakhs
Total Expenditure	115.22 lakhs	53.88 Lakhs
Profit	6.42lakhs	10.33 Lakhs

Project Extension-Plastic Waste Management Unit

- Three Plastic Waste Management Unit(PWMU/Mini MRF) have been established in Udupi district.
- First Plastic Waste Management Unit located in 80 Badagubettu Gram Panchayath limit inaugurated and will start functioning from Feb, 2023.
- Significance of recently inaugurated PWMU is that it adopted Pay Back Business model, which is first in the Waste Management
- Baeru Environmental Service Private limited who quoted highest purchase rate for 1 Kg of waste emerged as successful bidder.
- Remaining two PWMU will be functional in next two months.

Impacts of MRF



- Inclusion of unorganised entrepreneurs into a formal supply chain
- Creating an incentive for supply of good quality carton
- Better living standards and career in waste management for all staff employed through this project
- Safe equitable opportunities for women across all levels supported by policies to avoid any form of discrimination
- Optimal working conditions for workforce through best industrial practices and ensuring fair incentives
- Creating an improved supply chain for reuse of carton with better price realisation
- Maximise resource recovery from waste
- Responsible management of waste to ensure diversion from landfill
- Reducing avoidable contamination through design for recycling
- Scientific management of waste to reduce greenhouse gases
- Reduce the negative effect of various operations and transportation of waste
- Creating traceability to ensure diversion from landfill and open burning of waste

MRF You Tube Link

- https://youtu.be/7hjEvr71zZk

Usage of Plastic Waste for Roads

- As per the government order issued on 20.10.2022 plastic waste can be used for road formation along with bitumin.(10% of plastic)

*Earlier training along with demonstration had been conducted to all GPs and Technical staff by Rajgopalan Vasudevan on 10.12.2019

*So far 42 Tones of Plastic Waste has been used for the development of road under PMGSY scheme and GP level as well(20 KM road formation)

Plastic waste used for road formed in Alevoor in 2019

Thande Kokkarne Road formed in 2022

Plastic Road formation in Brahmavara Taluk, Udupi District

THANK YOU