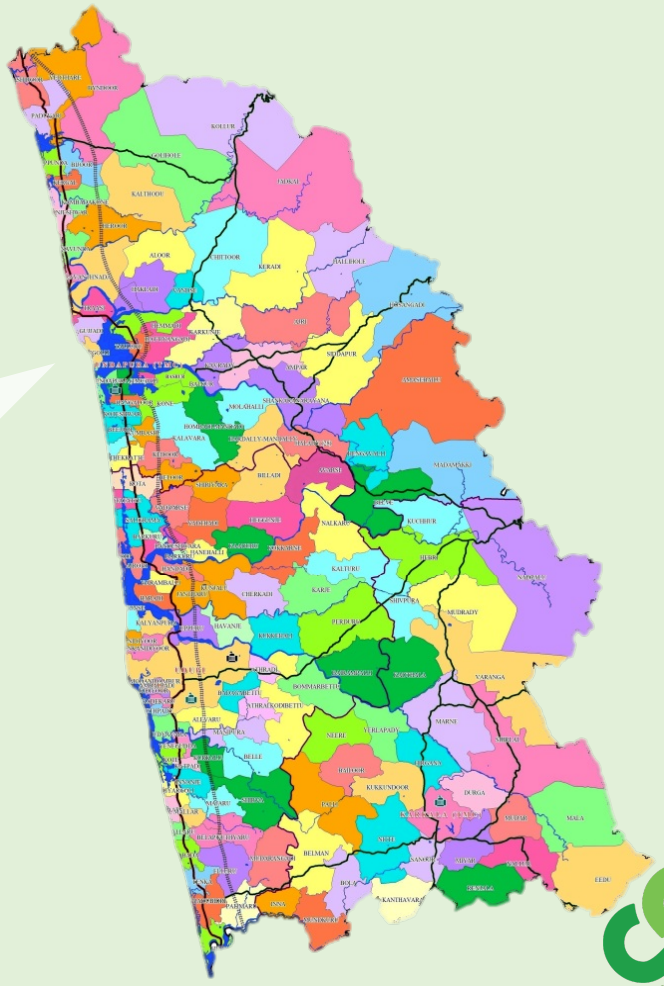
Best practices in Udupi – Solid waste management

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: 2,50,000
Literacy rate of the district: 83%



Solid Waste Management Journey of Udupi

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- Under two sub-missions of **SBM(G) & SBM(U),** 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. As a result **SLRM** was introduced in Udupi in 2017.
- Practice of Waste to resource conversion has been adopted & **local SHG's** were trained for waste management in GP's.
- Solid Liquid Resource Management (SLRM) is a method to convert garbage into source of income and thereby creating employment opportunities.
- Dustbins & bags were distributed to every household to collect the organic and inorganic items from households & commercial centers.

SLRM Model

- An SLRM Center for each Gram Panchayat was set up.
- Each SLRM/SWM Center would have one collection vehicle, supervisor and 4-6 workers.
- Green buckets were supplied to collect Organic waste like Awareness program and door to door visits were conducted regarding usage of green.
- Source segregated waste which was collected from households & commercials were sorted in to multiple different categories & the recovered materials were sold to local dealers.
- Minimal user fee was collected from houses & commercial for the operational cost of the SWM unit.

IEC Activities:

For every households bins were distributed for 3 way segregation.

- **Trainings and workshops for SHG's, Schools & Anganwadi Centres**

- **School Rally's**

- **ACP Boards Installation**

- **Pocket Calendars distribution containing Segregation information**

BCC Activity – Sustainable black spot makeover

(Behavioural Change Communication)

- A Huge Blackspot at Bommarabettu GP was finally cleared and converted into a beautiful garden successfully completing the BCC Activity.
- A good number of improvement can be seen in the waste collection (Table).
- The important step in beautification is to maintain it, this garden is well protected and maintained with a sprinkler system for regular watering the plants.

Month	Coverage	HH's Giving Waste
October	1000	431
November	1100	455
December	1199	1009
January	1530	1466
February	2883	2218
March	3260	3223

Wet waste management

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

Accomplishments of SLRM

- 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 for rural women.
- Creating a reliable garbage collecting system in rural areas.
- Managing the waste generated in the village successfully.
- Increasing scarp business in the nearby area.

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
- Many of the Gram Panchayat were not sustainable
- No minimum wages to workers.
- Social compliances were not met.

First Rural MRF of India – Nitte G.P

Why MRF?

10,000 Sqft

10 TPD

150-200 Kg per staff per shift

- Decentralised processing
- Traceability of material
- Improved manpower efficiency through mechanization
- Aggregation helps in better price realization (increased selling rate) of dry waste
- Supply to authorised end destinations
- Skilling the BOP, dignity of labour, established career in waste management industry
- Safe working conditions - highest level of OH&S, fire safety
- Hygienic work environment
- Employee welfare and social security
- Automated fleet management and scrap inventory management
- Reduce pilferages

Knowledge &Technical partner - Saahas Zero Waste

- Project initiation, solution design
- MRF facility design
- Machinery procurement
- Establish supply chain
- Training the Operator & their staffs
- Operation ramp up

Design and Build

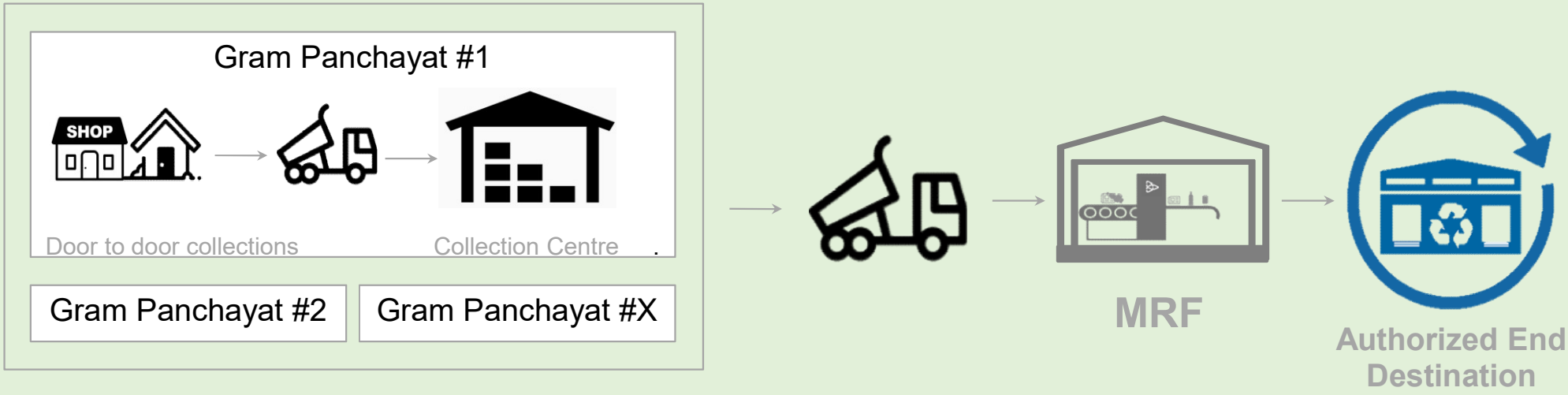
- Project management and support from survey till steady state operations.
- Auditing and constant monitoring
- Support entrepreneur towards development of waste management landscape within catchment area
- Introduce various business models to ensure viability and self sustenance

- Operate with full compliance and responsible waste management
- Uninterrupted operations at the MRF
- Create transparent marketplace for Waste Workers and other informal workers to sell dry waste
- Data capture and monthly reporting

- Capital Cost (Infrastructure, machinery)

- Suitable vacant land (10,000 sft area for operations of 10T/day and 6,000 sft for operations of 5T/day)
- Door to door waste collections
- Collect monthly service fee from waste generators and provide to entrepreneur
- Safe and responsible management of sanitary waste, inerts & mixed waste

MRF Process Flow



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.

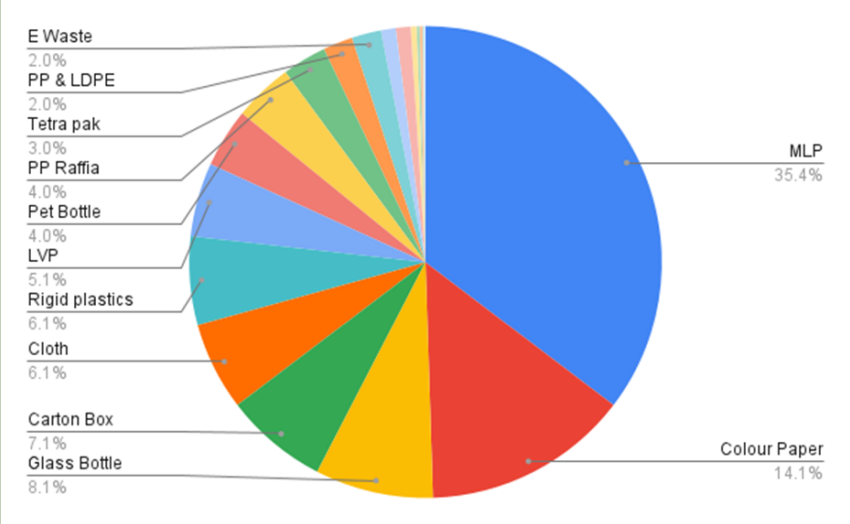
1. Survey & Planning

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

MRF Capex

Sl. No.	Particular	Amount
1	Civil Infra Structure (PEB structure including office, kitchen, toilets)	170 Lakhs
2	Machinery and equipment (Processing, Material handling & other equipment's, Truck, weighbridge)	90 Lakhs
3	Road construction & other expenses	50 Lakhs
	Total	**300 Lakhs**

MRF waste characterisation



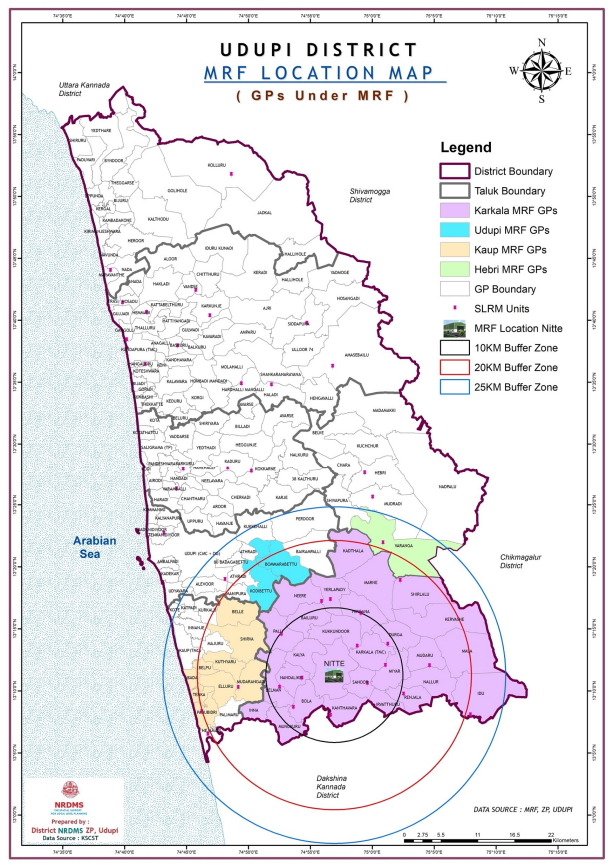
Sl. No.	Item	Percentage obtained (%)
1	MLP	35%
2	Color Paper	14%
3	Glass Bottle	8%
4	Carton Box	7%
5	Cloth	6%
6	Rigid plastics	6%
7	LVP	5%
8	Pet Bottle	4%
9	PP Raffia	4%
10	Tetra pak	3%
11	PP & LDPE	2%
12	E Waste	2%
13	Books	1%
14	MS Metal	1%
15	Thermocol	0.4%
16	Footwear	0.2%
17	Coconut shell	0.2%
18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

MRF Opex – its self sustainable with service fee

Details of MRF Operations from Aug, 21 to Feb, 22		
Expenditure details	4 MT/day	
	Rate (Rs/unit)	Total Amount (Rs)
Average Qty processed per month (Kg)		525,335
Manpower	8	4,289,483
Maintenance	4	2,017,836
Total expenditure	12.0	6,307,319
Income for sale of waste	8.7	4,585,649
service fee per kg	3.4	1,768,811
Total revenue	12.2	6,428,312
Gross Margin	**0.2**	**120,993**
GM%		**2%**

Impact of MRF	
Operational from	8 months
Total dry waste processed	605 MT
Employment generation	30+ staffs
Revenue generated	> 60 lakhs
Villages covered	43
Low valuables diverted	> 40%

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	40 grams
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

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

Thank You