Sustainable waste management in Gram Panchayats – Guidelines and Best Practices

About Saahas

Saahas is a not-for-profit organization founded in **2001** to provide **holistic and scientific solutions to responsibly manage solid waste**
Saahas plays the role of an enabler in India's path towards Circular Economy.

Our vast on ground implementation experience is backed by a qualified workforce comprising of both development sector and corporate sector professionals

We are headquartered in Bangalore, with regional office in Gurgaon

www.saahas.org

Vision

Enable India to become a leading Circular Economy where *Nothing is Waste*.

Mission

- Pilot innovative resource management programs.
- Collaborate closely with communities, administrators, businesses and law makers.
- Evolve next practices for adoption of Circular Economy

Purpose

Maximize circular flow of material while generating dignified livelihoods.

Key work areas

- Institutionalizing SWM systems in rural & urban areas
- Systematizing reverse logistics and recycling
- Enhancing value through specialized resource management processes;
- Driving waste reduction & life extension of products/materials
- Developing and disseminating knowledge

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Stakeholders engaged

- Community
- Government – Elected representatives and Executive
- Educational Institutions, Academia
- Technology providers, innovators
- Corporates
- CSOs

SDGs Impacted

Impact 2022-23

Across 11 states, 28 districts
200+ Gram Panchayats, 8 urban centres

131.5MT per day of waste influenced
121.69MT of waste eliminated
46.17MT of C&D waste collected
36.15MT of waste sent for reuse, repurpose

59 decentralized processing units set up
22.05 Lakh people reached out to
205 livelihood generated/enhanced

Compliances and certifications:
Registered as a Society
CSR-1, 12A, 80G, FCRA, Darpan, PF, ESI, PAN, TAN

Focus areas in rural SWM

IEC/BCC

Should cover:

Source segregation

Waste reduction

Understand need for waste management as a service

Need for user fee, penalty and fines

Build Capacity

Awareness about the implementation steps;

Knowledge about right infrastructure for collection and processing;

Understanding O&M;

Awareness about Govt funding schemes;

Infrastructure

Suitable infrastructure, tailored for the specific location;

Sources of funds for setting up of infrastructure

Operations

Adequate staff for collection, processing, monitoring

Costs of disposal of non-recyclable items and domestic hazardous to be factored in

Sustenance

Monitoring & evaluation, recovery of operational costs

For

Sustained source segregation and operations

Stages of rural SWM

0

No door to door collection;
No waste management unit;
All waste dumped/burnt

1

Waste management Unit built
And/or Collection vehicle procured
But no collection & processing

2

Source segregation practiced;
Door to Door Collection by GP staff/SHGs/External Agency (Daily/Weekly);
Dry waste sorted into 6-7 categories & sold; Wet waste composted;
Non-recyclables, sanitary waste dumped/burnt
O&M costs partially recovered through sale of waste, partial or no user fee

3

Regular 3-way collection GP staff/SHGs/External Agency;
Wet waste getting composted, dry waste by sorted into 6-7 categories and sold
Rest of the dry waste being sent to PWM Unit/MRF or non-recyclables sent to cement plants
Sanitary landfill created for sanitary waste and rejects
O&M recovered through user fee, sale of waste, gap funding from GP funds/other Govt schemes

4

Stage 3 +
Sanitary waste collected by authorized bio-medical waste handler
Bioremediation of existing dumpsite done

Enablers

- Land identified
- SBM funds/other infra funds used
- Intensive IEC;
- Staff deployed/ operations handed over to SHGs
- Scrap dealers mapped
- Resolution for user fee passed;
- PMU/MRF set up
- EPR/other funds
- Gap funding thru 15th Finance
- Monitoring
- Tie up with PHC/bio-medical waste handler

Different stages of rural SWM

Stage 1

Status
- No regular door-to-door collection
- One tractor used for multiple purposes picks up the waste from dumpsites once in a while and dumps somewhere outside habitable areas of the GP

Issues:
- Blocked drains
- Growing dumpsite
- Frequent instances of waste burning

Stage 2

Status
- Regular 2-way door-to-door collection using tractor and GP staff/ SHGs/ External agency/CSR support
- Wet waste getting composted/Vermi-compost, dry waste sorted into 6-7 categories and sold to scrap dealers
- Rest of the waste (mixed, sanitary, rejects) either dumped in the old dumpsite or burnt once in a while

Result:
- Reduction in blockage of drains
- Improved visual cleanliness
- Dumpsite reduced but not eliminated
- No solution for sanitary and other special waste streams

Different stages of rural SWM

Stage 3

Status

- Regular 3-way collection by GP staff/SHGs/External Agency
- All operational expenses covered
- Wet waste getting composted/Vermi-compost, dry waste sorted into 6-7 categories and sold to scrap dealers
- Rest of the dry waste being sent to PWM Unit/MRF
- Sanitary landfill created for sanitary waste and rejects

Stage 4

Status

- Stage 3 +
- Sanitary waste collected by authorized bio-medical waste handler
- Horticulture waste composted with wet waste or separate pile composting done
- Bioremediation of existing dumpsite done

Different models of SWM implementation

Model 1: Entire SWM supported by CSR funds

- Infrastructure provided by funder
- Collection and processing staff on rolls of NGO, salaries paid by funder
- IEC/BCC, Community engagement, operations, monitoring done by NGO staff
- Cost of sending non-recyclables to cement plants borne by funder
- Income from sale of dry waste given as incentive to collection & processing staff or given to GP to meet SWM related expenses

Challenges:

- System can never run on its own, always dependent on the CSR funds
- No ownership by GP and Secretary/PDOs

Mostly implemented in GPs around factories and manufacturing plants.
Many early success stories like in Madukarrai are now struggling to come out of this system.

Different models of SWM implementation

Model 2: Infrastructure and part operations by CSR funds, partial operations by GP own funds and sale from waste, user fee

- Infrastructure provided by funder
- Part salary of collection and processing staff funded by CSR, partly borne by the GP
- IEC/BCC, Community engagement, operations, monitoring done by NGO staff
- Cost of sending non-recyclables to cement plants borne by funder
- User fee collected. The income from user fee given to GP
- Income from sale of dry waste given to GP
- GP gradually takes over entire operations and monitoring using the user fee and income from slae of waste

Challenges:

- Risk of GPs not taking over after the set timeframe

We have implemented in some of our projects, limited success

Different models of SWM implementation

Model 3: NGO provides IEC/BCC, Capacity building, Technical support thru CSR funds, operations by GP own funds, sale from waste, user fee

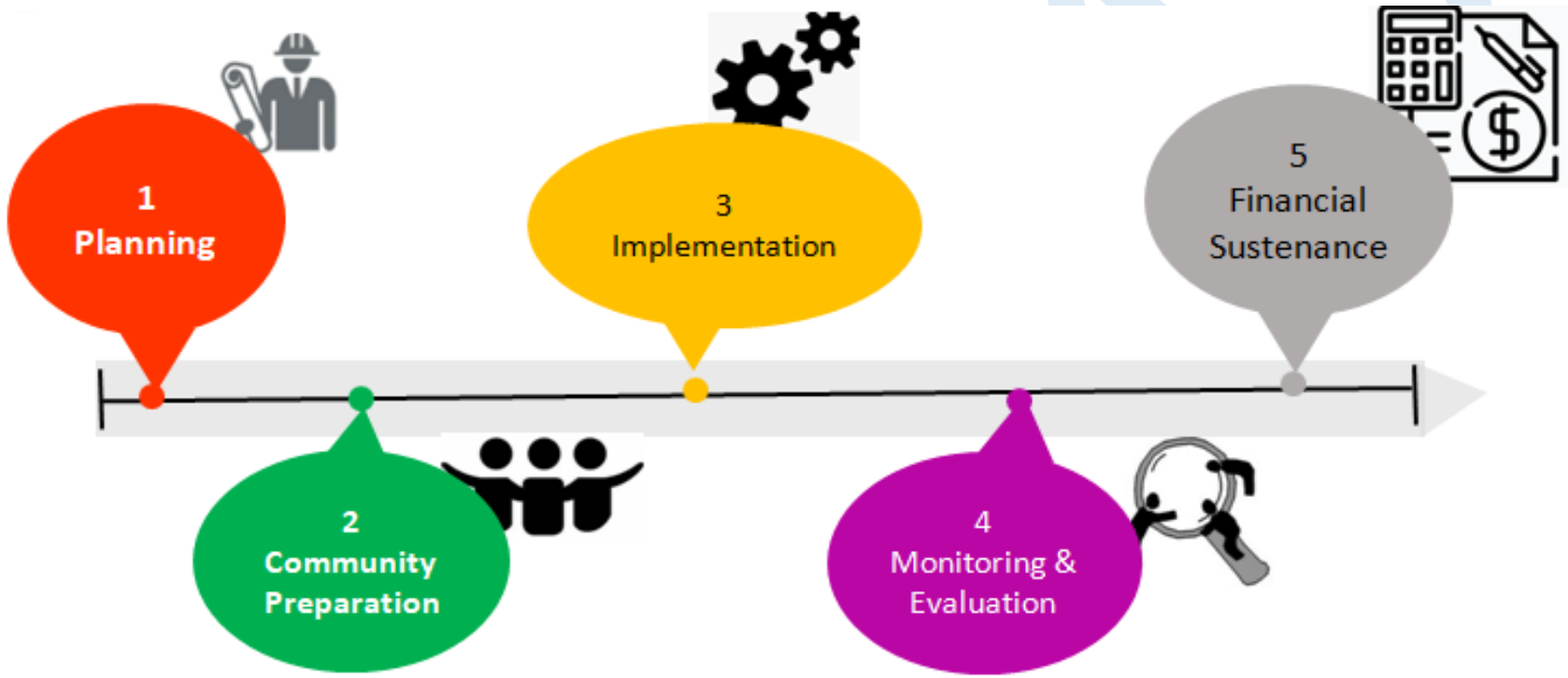
- Infrastructure provided by funder or mobilized by GP through Govt schemes
- Salary of collection and processing staff borne by the GP or collection & processing given to SHGs/external entity
- IEC/BCC, Community engagement, operations, monitoring done by NGO staff
- Cost of sending non-recyclables to cement plants borne by GP
- User fee collected by SHG/external agency.
- Income from sale of dry waste given to SHG/external agency
- GP pays the SHG/external agency the gap funding till they are able to become viable

Challenges:

- If user fee payment is not regular then SHG will not be able to recover its costs

We have implemented in some of our projects, seen some success in Karnataka and Telangana

Steps in setting up SWM system



Step 1: Planning and Implementation of solid waste management

Planning

- Survey to estimate the type and amount of waste generated
- Identify roles and responsibilities of different stakeholders, Preparing DPR with financial budgets
- Allotment of funds
  Plan IEC and BCC activities
- Panchayat functionaries meet up and plan the phases of implementation, discuss the same in Gram Sabha meetings

Step 1: Planning and Implementation of solid waste management

Planning

Plan man power for collection

Option i: Panchayat can hire the collection staff depending on their funds availability

Option ii: Panchayat can identify a collection agency (Eg., a co-operative or a self help group or NGOs)

Material planning

Procurement of Vehicle, Identification of land for processing facility, processing equipment

Setting up infrastructure facilities

Secondary sorting of dry waste, Identify destinations for each stream of waste

Typical Capex and Opex

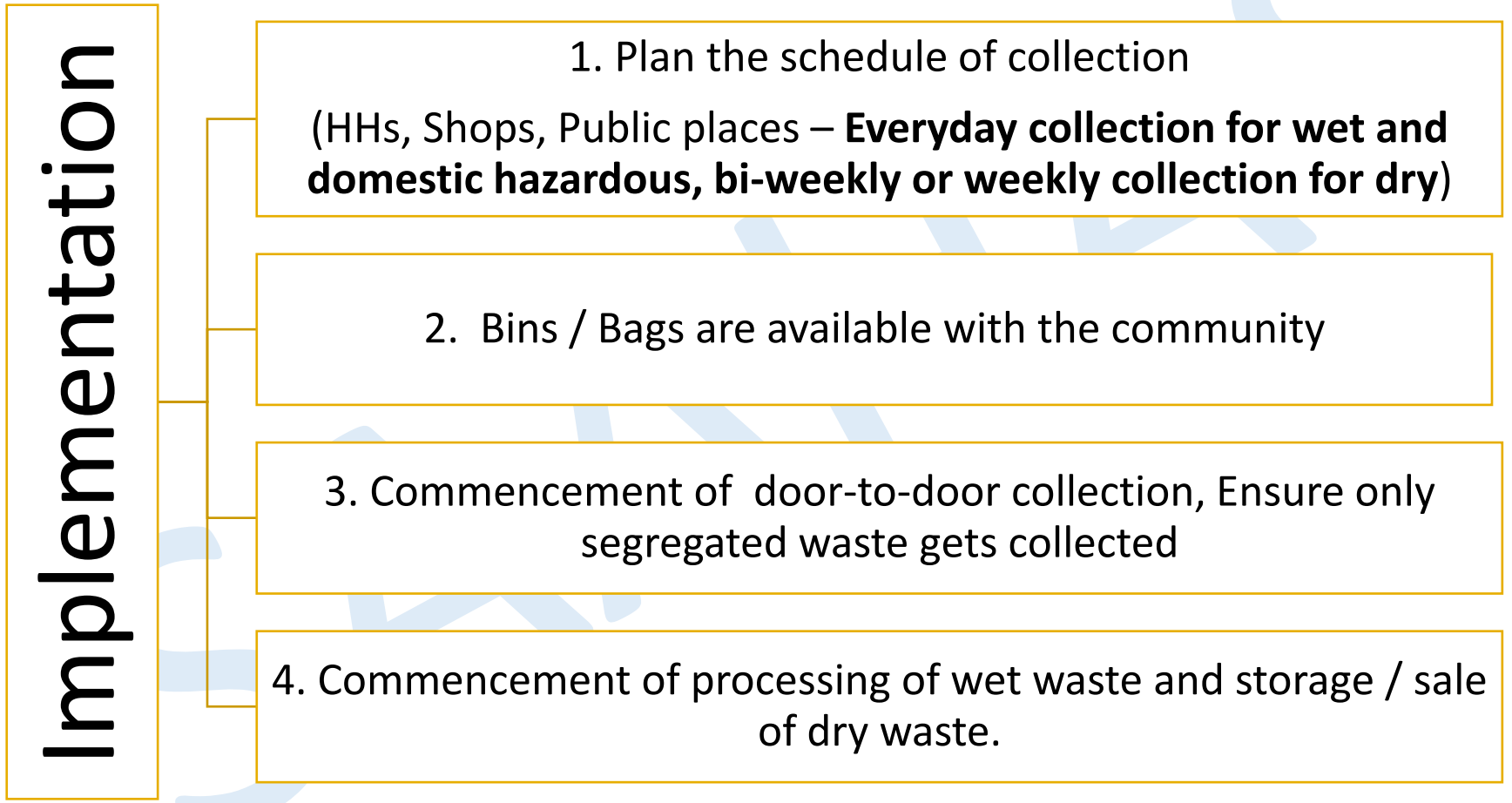
Infrastructure cost	Operational Cost
Cost of acquisition of land for SWM units	Salaries
Cost of civil works of solid waste management shed	(i) Personnel for street sweeping, collection, wet waste management
Cost of civil works of compost pits / Biogas plant	(i) Drivers
Cost of procurement of collection vehicles	(i) Manager of the waste management unit, if any
Cost of other equipment, machinery (shredder, rotary sieve etc)	Water and electricity
	Consumables (such as PPE, bio-solution, worms)
	Fuel
	Repair and maintenance (vehicle and equipment maintenance)
	Transportation costs for transporting non-recyclable/recyclable dry waste to the nearest ULB.
	Any other recurrent expenditure

STEP 2: INFORMATION, EDUCATION AND COMMUNICATION (IEC) & BEHAVIOUR CHANGE COMMUNICATION (BCC)

Community Preparation

- Design IEC activities
- Conduct awareness through NGOs, volunteers, NSS, etc.,
- Conduct public events – Street plays, Kala Jaathas, School programs.
  Motivate the officials, citizens performing well
- Wall painting, distributing pamphlets etc

STEP 3: IMPLEMENTATION



STEP 4: MONITORING & SUPERVISION

Monitoring Framework

1. Identify and form a committee with stakeholders from District, panchayat, community and the collection agency; try to revive VWSC

2. The committee meets monthly or quarterly and reviews the progress of SWM – Eg., Level of segregation, Usage of SWM facilities, IEC events, complaints etc

3. Roles and responsibilities of committee

STEP 5: SUSTAINABILITY

Financial Sustainability

1. Revenue through user fee
2. Sale of compost and recyclable dry waste
3. Any excess expenditure to be met by funds from panchayat

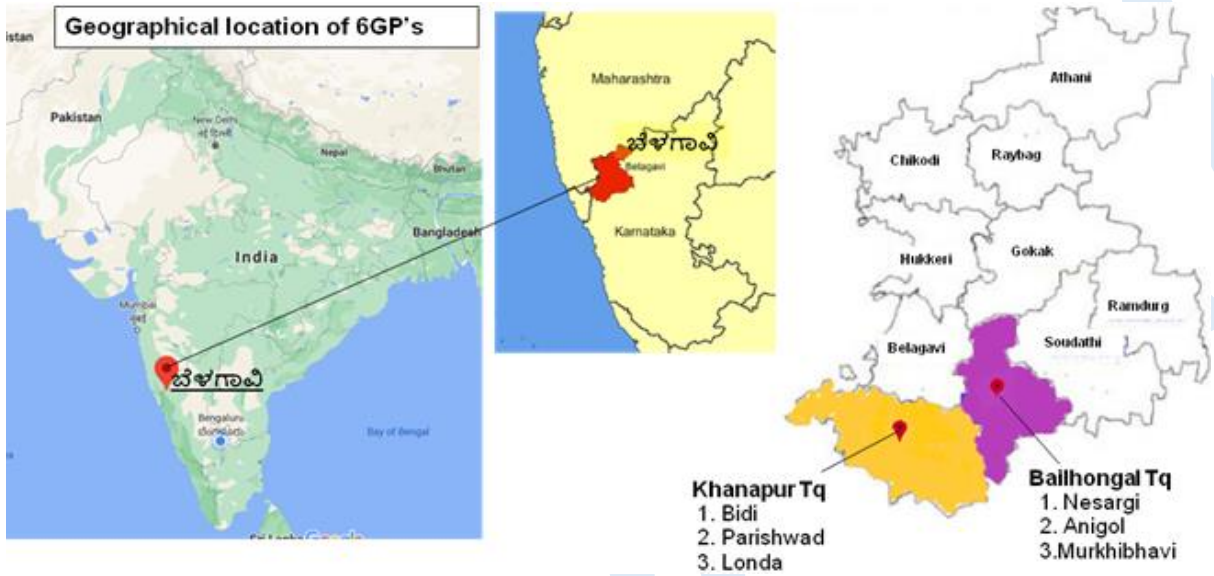
Possible sources of funds

Item	Source of funds
Purchase of vehicles	SBM (G) Funds / 15th Finance
Construction of Dry waste units and composting tanks	MGNREGS
Training for GPLF MBKs and SHGs on SWM implementation	NRLM/MGRIED
Salaries of staff / maintenance / Sending dry waste to MRF/Cement plants	User Fee / Penalties / 15th Finance/EPR
Gap funding to support SHG (Salaries)	GP Funds (Property Tax)
Purchase of bins	15th Finance
Infrastructure / IEC / Operations support	CSR funds (only to kick start, cant be looked at as a long term solution

Case study, stage 2 GP: Nesargi GP, Belagavi Dist, Karnataka

GP managed SWM model

Nesargi GP of Bailhongal Taluk of Belagavi Dist in Karnataka –



Supported by saahas in partnership with UNICEF

Steps followed

Baseline survey, situation analysis

DPR preparation & Approval

Engaging with Community

Steps followed

IEC

Bins and bag distribution

Waste collection using hired vehicle by SHGs

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Steps followed

Dry waste storage and sorting in old building

Wet waste composting in a pit

Monitoring & Evaluation, VWSC meetings

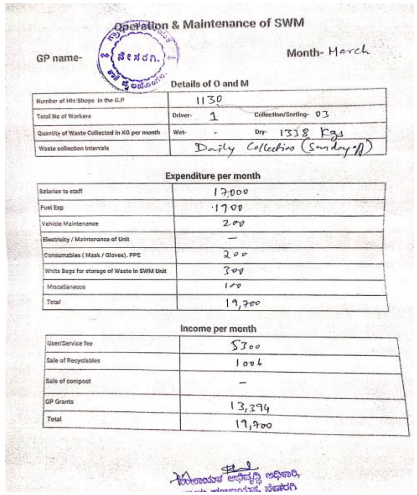
Steps followed

Sustenance thru user fee, sale of waste, gap funding

Book keeping

Log books for attendance, waste data and income & expenditure

Total HH and shops in GP	Total HH and shops giving waste	Total HH and shops Giving Segregated Waste	% of coverage by collection vehicle	Total segregation % against total community	Wet waste in (KG)	Dry waste in (KG)
1130	937	646	100 %	57%	3760 kgs	1440 kgs



Operation & Maintenance of SWM

GP name- ಕೆಸಡಿ.

Month- March

Details of O and M

Number of HH/Shops in the G.P	1130
Total No of Workers	Driver- 1 Collection/Sorting- 03
Quantity of Waste Collected in KG per month	Wet- - Dry- 1338 Kgs
Waste collection Intervals	Daily Collecting (Sunday off)

Expenditure per month

Salaries to staff	17,000
Fuel Exp	1708
Vehicle Maintenance	200
Electricity / Maintenance of Unit	—
Consumables (Mask / Gloves), PPE	200
White Bags for storage of Waste in SWM Unit	300
Miscellaneous	100
Total	19,700

Income per month

User/Service fee	5300
Sale of Recyclables	1004
Sale of compost	—
GP Grants	13,396
Total	19,700

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O&M Sheet

SHGs working in the GP

Operation & Maintenance of SWM

GP name- ಬೇವಿನಕಟ್ಟಿ

Month- March

Details of O and M

Number of HH/Shops in the G.P	1130
Total No of Workers	Driver- 1 Collection/Sorting- 03
Quantity of Waste Collected in KG per month	Wet- - Dry- 1338 Kgs
Waste collection Intervals	Daily Collection (Sunday off)

Expenditure per month

Salaries to staff	17,000
Fuel Exp	1700
Vehicle Maintenance	200
Electricity / Maintenance of Unit	—
Consumables (Mask / Gloves). PPE	200
White Bags for storage of Waste in SWM Unit	300
Miscellaneous	100
Total	19,700

Income per month

User/Service fee	5300
Sale of Recyclables	1006
Sale of compost	—
GP Grants	13,394
Total	19,700

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ಗ್ರಾಮ ಪಂಚಾಯತ, ಬೇವಿನಕಟ್ಟಿ
ತಾ॥ ಬೈಲಹೊಂಗಲ.

More commercials so good revenue generation in **BIDI GP**

Details of O and M

Number of HH/Shops in the G.P	1848
Total No of Workers	Driver- 01 Collection/Sorting- 03
Quantity of Waste Collected in KG per month	Wet- 7650kgs Dry- 1770kgs
Waste collection Intervals	Daily

Expenditure per month

Salaries to staff	22,000/-
Fuel Exp	6000/-
Vehicle Maintenance	—
Electricity / Maintenance of Unit	—
Consumables (Mask / Gloves). PPE	750/-
White Bags for storage of Waste in SWM Unit	—
Miscellaneous	—
Total	28,750/-

Income per month

User/Service fee	18120/-
Sale of Recyclables	5331/-
Sale of compost	—
GP Grants	7750/-
Total	31,201/-

M.D
SECRETARY
GRAM PANCHAYAT BEED
TAL KHANAPUR DIST BELGAUM

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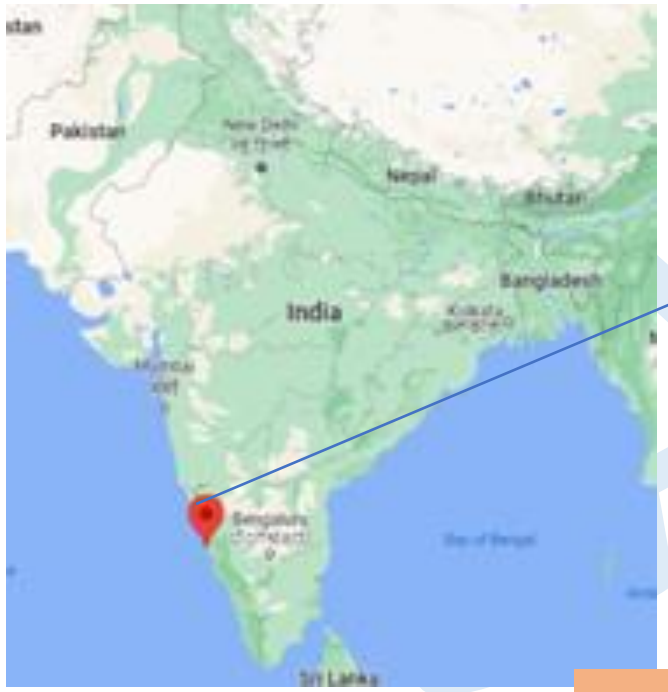
Case study, stage 3 GP: Saanur GP, Udupi Dist, Karnataka

Saanur GP is located at Karkala Taluk of UDUPI District
SWM Implemented supported by Saahas
In partnership with **HCL Foundation**



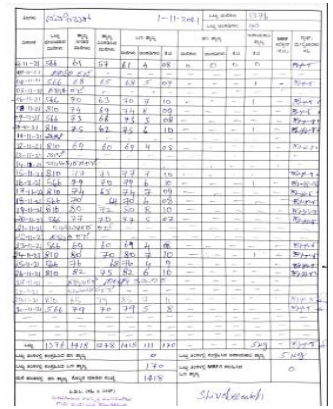
Saanur GP

Steps followed

Dry waste storage and sorting in Shed

Processing at MRF

Monitoring & Book keeping



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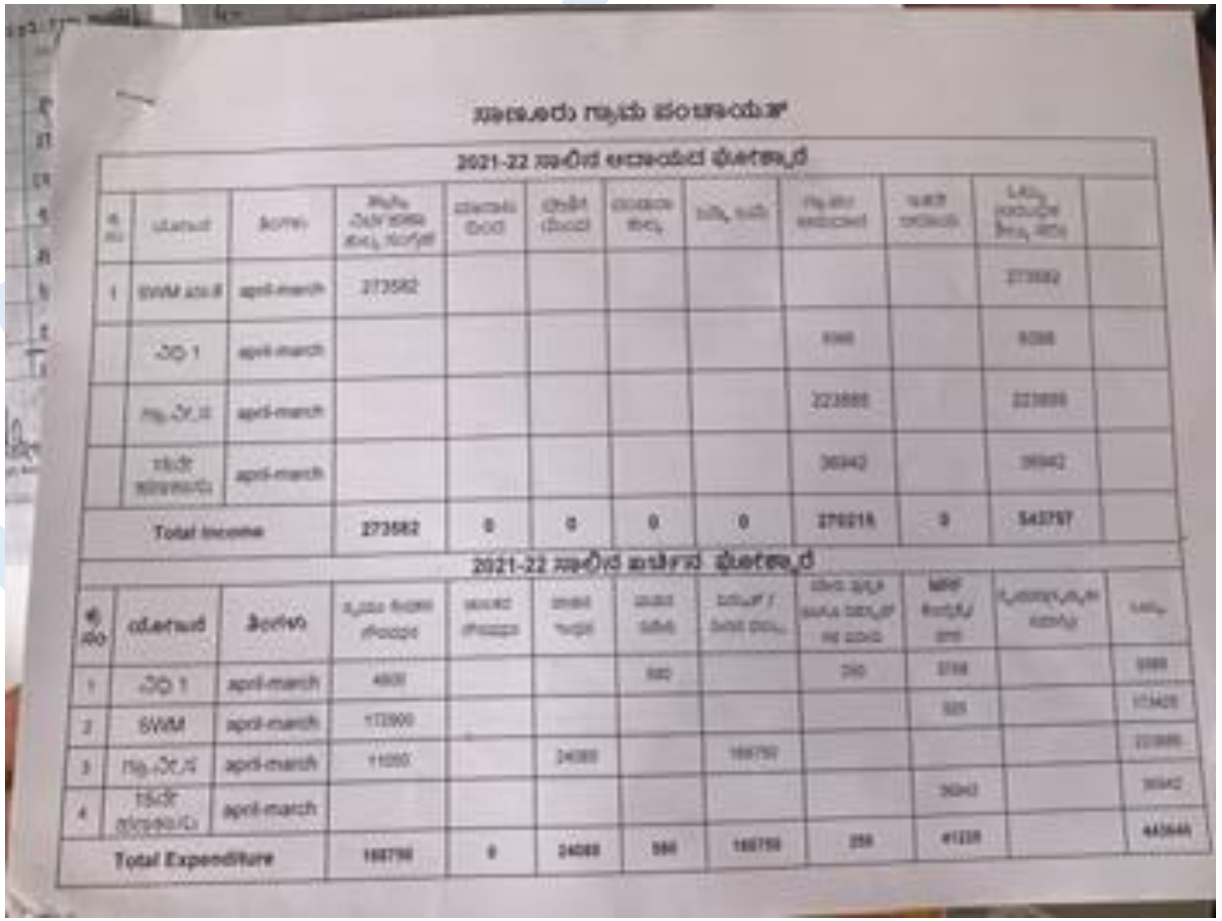
O&M Sheet

Annual, for 21-22

Revenue		
Sl no	Source of Income	Rs
1	Sale of Recyclables	0
2	Sale of compost	0
3	User fee collection	261582
4	Penalties	12000
Total Income		273582

Expenditure		
Sl no	Source of Income	Rs
1	Salary expense	188750
2	Diesel	24085
3	Expenditure involved to send Dry waste to MRF	41225
4	Maintenance cost	1500
5	Electricity Bill	14000
Total Expenditure		269560



Why Material Recovery Facility ?

Why MRF?

- 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

Sanitary waste disposal options for GPs - WIP

Sanitary waste handling:

Small incinerators are not safe, are not being used in most locations where they have been provided

Tie up with bio-medical waste agency – typical charges Rs.30-50 per kg + transportation cost of shifting to nearest PHC.

Trying a pilot only for sanitary waste to estimate the actual cost of incineration of

Increases the overall operational cost of the SWM

Bioremediation options for GPs - WIP

Bio-remediation of existing landfill/dumpsite:

Rental machine available, can take up a cluster of GPs. Under evaluation

Capacity: 30 tonnes per day

Cost: Rs.500 per tonne (including Diesel, labour, the recovered plastic sent to nearest cement plant)

Summary

Reduce expenses:

- Manpower cost by optimizing collection while maximizing coverage (weekly collection of only dry waste using existing Panchayat staff)
- Optimal sorting into only categories for which you have buyers

Increase income:

- Finding more buyers by doing a detailed scrap dealer mapping
- Charging user fee, start with commercial establishments
- Connect with nearest Plastic Waste Management Aggregation Centre or Material Recovery Facility
- Garner EPR funds, other funds coming to stop ocean bound plastics to support pick up MLPs and low value plastics

Summary

Whether with SHG based or Panchayat staff based model, meeting operational cost and continuing source segregation remain the biggest challenges

Possible solutions:

- Minimize operational cost by weekly dry waste collection
- Start with user fee from commercial establishments
- 15th finance funds, other govt schemes to be explored
- Tie ups for EPR, other funds coming into the sector to be routed to rural areas
- Tie-ups with cement plants at district level
- Multi-GP, Urban-rural convergence

Thank you

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