



TRASHMAFIA

TrashMafia

Waste Management Business Strategy

A Pitch Deck Presentation By

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“If you waste it once...you pay for it twice!”



1. What is Trash Mafia?

Introduction:

- Municipalities are unable to deal with Solid Waste (MSW) due to large populations, despite spending 5-25% of their budget on MSWM.
- **Indian Central Pollution Control Board (CPCB)** estimates in 2013-14 show that MSW of **144,165 MT per day was generated in India**, of which **80%** (115,742 MT) was **collected** and only **22.8%** (32,871 MT) was **treated**. – See Slide Caption No 6. - Total Aggregate Market size & Segment(s) TM will focus

Purpose:

- **Purpose:** Strive for a **“CLEAN INDIA”** by dealing with collection, segregation & disposal of Municipal Solid Waste (MSW) on a PAN INDIA basis
- **Vision:** A **leader PAN INDIA** (i.e. among top 5 players) with a difference - technological edge in MSW collection, **reaching a capacity of around 20,000 MT** annually by 2025 (or **12.5% of MSW market** which is expected to grow to 160000 MT) (compared to existing players who achieve around 9000-10000 MT p.a). See TM's Value addition (differentiation from competition) – Slide Caption No. 4.1
- **Mission:** Establish its **presence in Chennai, Tamil Nadu** as a pilot for this project, with a base collection capacity of 5 MT per day (i.e. 1500 MT annually, assuming 300 working days) and in a phased manner launch its operations in every major state capital (with large urban population), covering atleast 11 states by 2025.
- The **collection capacity would be scaled up** by **20%, 30%, 40% & 50%** in each state after 3 year intervals, in all chosen states, through efficiently utilizing its resources, and benefits derived from actual experience.

2. Who runs Trash Mafia?

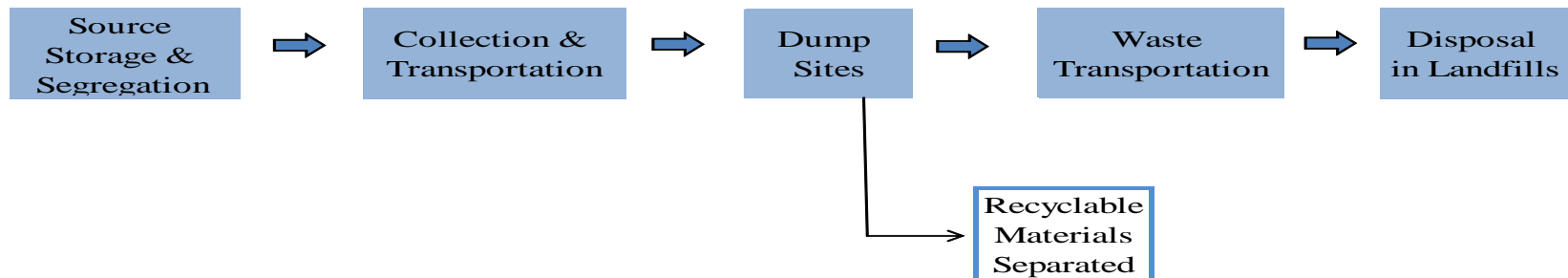
- **Vineet Vinayak** has worked on management teams of several school/college ventures & events involving audiences of 10,000+. At the school level, he founded Ambiente GreenCorps to motivate students to push forth initiatives such as vermicomposting, rainwater harvesting and solar panel installations for communities/industries on Kanakpura Road, Bangalore. He has personally signed MOUs with W2W majors like RMZ Corp & KK Plastics to use campus waste to build roads/buildings. He has made paper presentations on the effects of waste/industrial toxins on water supplies and bioreserves. At NITT, he has led publicity teams for NITT's international fests. He has won several leadership scholarships for his exemplary drive to improve environmental conservation and innovation. He has deferred highly in-demand marketing positions at Amway Global, Purple Squirrel Eduventures and Uber to improve his knowledge base in management sciences & engineering, in the hope of starting a successful enviroventure. He already possesses VC contacts in the W2W industry in Bangalore, Pune & Chennai, and is building contacts with farming communities, administrative/marketing consultants and bioplant heads.
- **Mukund, Arun & Parth** are technical heads responsible for building TM's application from scratch. They possess a total of 7 years and 20 projects of experience in writing algorithms and building easy-to-use UIs in 3 different languages for academic/industrial customers. They are part of Technical Clubs like Delta and Spider at college and have worked in team sizes ranging from 2 to 20 with great success.
- The quadro have previously worked on building a unique e-Signature portal for NITT called QuikSign, which allows students to get forms signed/professors to append digital signatures in an efficient way, which is set to launch in July.

3. Problems

Problems:

- **Collection and disposal of MSW in India is** dominated by municipalities & local bodies. **Very few private institutions** are engaged in this activity.
- Also **MSW market is fragmented** with no dominant share of any single player
- Governments' apathy and indifference to handling the **problem of collection & sorting of waste** presents a challenge as well as opportunity for Private enterprises.
- **Pain of unsorted waste** - Households, office places, leisure places, markets/shops etc, often generate waste which is not properly sorted into wet & dry waste, resulting in **additional cost of sorting**.
- **MSW Value Chain** presented below gives an overview **of complexity of this activity**

MSW Collection-to-Disposal VALUE CHAIN



- **Slides 3.1 to 3.4 address key challenges & opportunities for TM in detail:**

3.1 Key *micro-level* Challenges & Opportunities

	Challenges (Problems)	Opportunities (Solutions)
1	Issues in Household (Source) Storage and Segregation of Waste <ul style="list-style-type: none"> Most households, shops, and establishments throw their waste just outside their premises, on streets, in drains, in open spaces, in water bodies, and in other inappropriate places. In most cases source segregation is not done. 	<ul style="list-style-type: none"> Citizens must be informed and motivated not to litter the streets so they develop the habit of storing their waste at its source in at least two separate bins (one for biodegradable waste and one for recyclable waste). Citizens also need to be educated about risks to human health and the environment and taught to separate domestic hazardous waste and infectious waste. Municipal authorities must take concerted efforts to convince all classes of citizens to store and segregate their waste properly.
2	No system of Primary Collection <ul style="list-style-type: none"> Municipal authorities consider themselves responsible only for waste collection at street collection points and do not feel it is their job to provide doorstep collection service, even though such service is now mandated in the rules. Lack of citizen involvement in the storage of waste at source, which would facilitate primary collection from the doorstep. 	<ul style="list-style-type: none"> An assessment of the housing situation, street conditions, and geographic and topographic situation is always a prerequisite for efficient planning and decision making for primary collection equipment. According to the Municipal Solid Waste (Management and handling) rules 2000, there are two options for primary collection: door-to-door collection at preset intervals or community bin collection (known as the <i>bring system</i>).

3.2 Key *micro-level* Challenges & Opportunities

	Challenges (Problems)	Opportunities (Solutions)
3	Irregular Street Sweeping <ul style="list-style-type: none"> No planning is done to ensure that all streets are swept regularly; there is no benchmark, or yardstick, prescribed by municipal authorities for street sweeping. The street sweepers are not given appropriate tools to perform their duties effectively. They are given short-handled brooms, which necessitate constant bending and cause fatigue and loss of productivity. 	<ul style="list-style-type: none"> A schedule of street cleaning that indicates which roads require daily cleaning and which ones need to be cleaned periodically. A program for street cleaning, keeping in view the norms of work (yardsticks) prescribed A timetable for cleaning of open public spaces daily or periodically.
4.	Poor Secondary Storage of Waste <ul style="list-style-type: none"> Waste depot sites are not evenly distributed in cities and towns. They are often very poorly designed and are not synchronized with the primary collection system. Waste depots are not emptied on a regular basis. Inappropriate secondary storage of waste leads to a “not in my backyard” (NIMBY) syndrome. 	<ul style="list-style-type: none"> Municipal authorities should identify suitable locations, preferably from among the existing locations of waste storage depots in the city Large containers ranging from three cubic meters to seven cubic meters should be placed for secondary storage of waste. Transfer stations should be decentralized within the city, allocated to an enclosed area, and situated in the general direction of the main landfill site.

3.3 Key *micro-level* Challenges & Opportunities

	Challenges (Problems)	Opportunities (Solutions)
5	Issues in waste Transportation <ul style="list-style-type: none"> Open trucks and tractors used to transport waste are loaded manually. This time-consuming activity results in loss of labour productivity and increases the occupational health risk to workers. The transport system is not synchronized with the secondary storage system. Problems arise when a transport fleet is modernized, because waste at the secondary storage system is still dumped on the ground. If the secondary storage system is modernized without an adequate fleet of modern vehicles, similar problems arise. 	<ul style="list-style-type: none"> The longer the distance to the landfill site, the more volume should be transported with each load. In case of long haul distances to the landfill site, transfer stations are found to be most efficient. Vehicles should be selected according to capital costs, carrying capacity, life expectancy, loading speed, local spare part availability, speed, fuel consumption, and maintenance costs. The transport of waste can be managed and monitored centrally or through a large decentralized arrangement Transport can be contracted out to private operators. The transport system must be harmonized with the secondary storage system of waste to prevent manual /multiple handling of waste.
6	Lack of Waste Treatment <ul style="list-style-type: none"> The MSW generated in Indian cities is, by and large, not treated but is directly taken to the open dumpsites. Although India is known for its age-old technology of composting agricultural waste, composting of municipal organic waste is infrequent. In a few cities, however, initiatives exist for aerobically composting or vermicomposting of municipal organic waste. However, many plants are not operated according to their installed capacity. Many plants face problems with compost marketing and find financial sustainability difficult. 	<ul style="list-style-type: none"> The municipal authorities must treat the organic fraction of waste before disposal. The authorities are expected to set up a plan for composting waste or to adopt waste to-energy technology as may be appropriate. Municipal authorities have to assess the suitability of new technology to Indian conditions.

3.4 Key *micro-level* Challenges & Opportunities

	Challenges (Problems)	Opportunities (Solutions)
7	<p>Inappropriate Disposal of Waste on Open Dumping Grounds</p> <ul style="list-style-type: none"> Waste is dumped in low-lying areas that are within or outside the cities and that are designated as dumping grounds or in unauthorized areas on the outskirts of the city. Sometimes waste is even dumped on the approach roads to rural areas, which do not have their own land for disposal of waste. Such practices result in extremely unsanitary conditions and create serious environmental degradation problems. Because no segregation of waste at its source takes place, domestic waste of all types, infectious waste from medical facilities, and even hazardous industrial waste are deposited at dumpsites that are actually designated for domestic waste. 	<ul style="list-style-type: none"> The state pollution control boards are required to prescribe the criteria for site selection in terms of distance to be maintained from habitation, water bodies, highways, railways, and so forth. The municipal authorities should follow the rules carefully when constructing an engineered landfill

4. What does TrashMafia offer?

Trash Mafia (TM) Solutions:

- TM will revolutionize the collection process by the use of **mobile app** and **selling partitioned trash cans** for effectively **sorting waste** so that:
 - dry recyclable waste such as bottles, paper, cans etc are sold to end-users or recyclers,
 - bio waste is processed to produce biogas; and manure and
 - inert waste is effectively disposed to landfills. Thus its end-users e.g. industrial customers would be willing to pay a premium to get *segregated* waste.
- TM will **add value at all points in the value chain** - waste collection – sorting – processing - disposal
- Mainly, **industrial customers** would be willing to **pay a premium to get *segregated* waste.**
- TM's would **minimize the collection cost**, resulting in cost savings accruing as waste wouldn't directly go to landfills.
- TM's **products would be cost competitive** even after considering the collection, sorting & processing costs.
- TM's **value addition (differentiation from competition)** is discussed in ***Slide 4.1***

4.1 TM's Value Addition (Differentiation from Competition)

How TM will add value?

1. **PAN INDIA Operations starting with Chennai** – capital of Tamil Nadu and eventually in **each of 11 other state Capitals** as compared to existing & new industry players localized in few states only.
2. **App assisted Technology** for facilitating collection of waste from households, office places, leisure places, markets/shops etc. - used by only few players
3. **Consortiums/signing contracts with upto 100 potential waste2wealth (W2W) customers** in every state to buy segregated waste(dry/wet) and increase conversion of urban recyclable waste to useful products to 50%, hence reducing landfill and trash site sizes/numbers by atleast 6%. And also to Build strong business relationships with 10,000 farming communities to utilize organic waste collection
4. **Use Nisargaruna Technology** developed by Bhabha Atomic Research Centre (BARC) to produce fertilizers for farming and biogas for domestic cooking/electricity generation, as it is low cost, and has several other advantages viz.:
 1. Generating employment and is self-sustainable with production of **fertilizers** and **biogas** as outputs
 2. Reliable and enduring technology due to modifications made in its design to prevent choking (though its initial cost maybe relatively higher than conventional gobar gas plants).
 3. Versatility in its capacity to tolerate varied biodegradable feed stock.
5. **Sustainable, profitable and scalable business through steady demand** for a **varied product profile** from typical customers viz:
 1. Households, office places, leisure places, markets/shops etc - for **plastic trash cans**;
 2. Small & medium businesses - **recyclable bottles, paper & plastics, cans, boxes etc**;
 3. Medium & large scale industries - **Bio gas as fuel energy**; and
 4. Agricultural sector / Nurseries - **Manures/ Fertilizers**
6. **Supply of partitioned plastic trash cans** to sort out wet and dry waste at source, thereby reducing cost of collection & segregation of waste.
7. **10 Special compartmentalised trucks (1 MT or more capacity)** for segregating Wet & Dry waste facilitating reduction in fuel & transport costs by optimization-on-distance/time algorithm.

5. Why now?

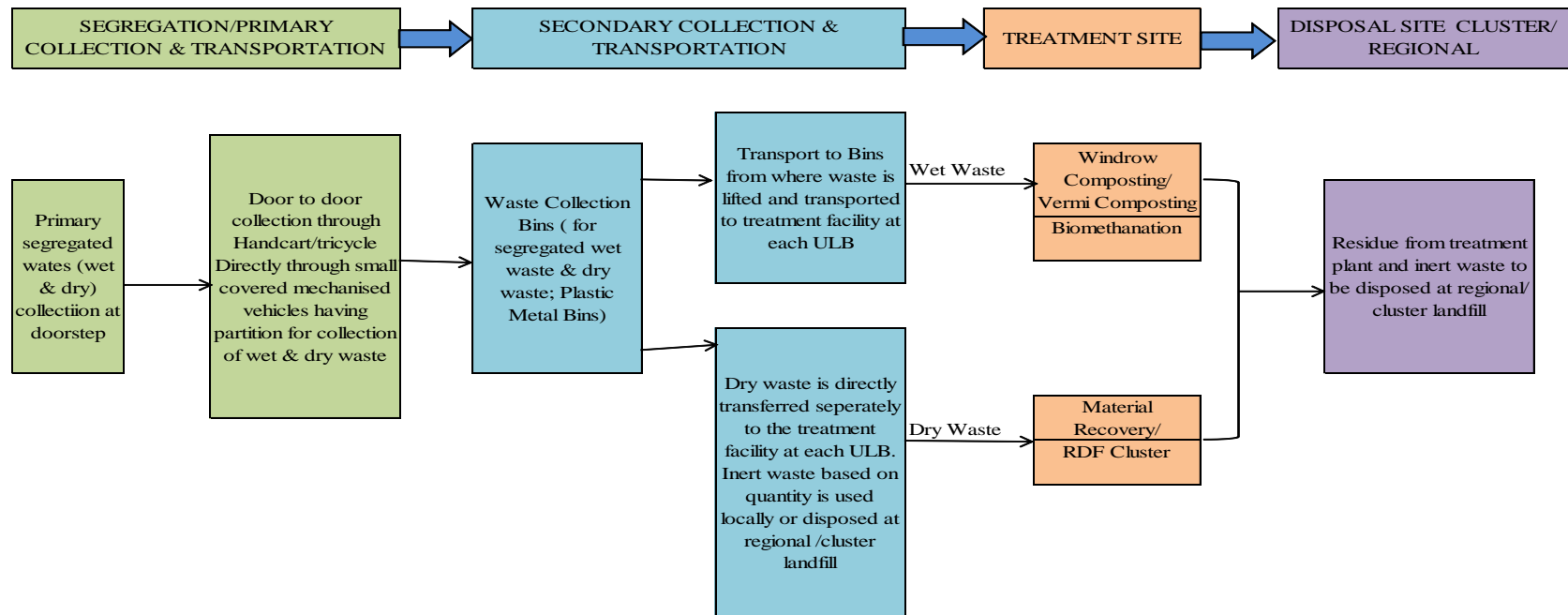
- Government of India has initiated a level playing field with a **Budget allocation of Rs 9,000 crore** for CLEAN INDIA (**Swachh Bharat Abhiyan**) and this would promote fair & free competition, thereby removing any barriers to entry in the MSW market.
- **MSW market being fragmented**, a major player who is well-established & well-funded or even a well funded new entrant with power & influence over the market, will not pose a major threat to **TM with its value addition /differentiation from competition – See Slide 4.1**
- **An outline of the historical evolution of the MSW market from a macro-level perspective and Critical Success factors** are discussed in **Slides 5.1 to 5.3**

5.1 Historical evolution - Key Macro-level Challenges

Key macro-level challenges/issues market faces

- MSWM services in the country are inefficient primarily due to financial constraints of ULBs, institutional problems within the departments, fragile links with other concerned agencies, lack of suitable staff, etc.
- Expenses towards MSWM are mostly met from the general budget and allocation from Property taxes. Very often, funding for operations and maintenance relating to provision of MSWM services is not earmarked and properly budgeted for.

Waste Segregation, Collection, Transportation, Treatment & Disposal – Flow chart



- Some of the challenges pertaining to **Operational**, **Capability** and **Infrastructural** related issues & **Critical Success factors** are outlined in **Slide 5.2**
- **Risks & Gaps are outlined at Slide 5.3**

5.2 Historical evolution – Inherent issues & Critical Success Factors

Operational/Service level Gaps:

- Low service coverage area
- Low waste collection efficiency
- Low waste recovery/ processing
- Low scientific disposal of waste
- Low redressal of user complaints
- Low user fee collection efficiency

Capacity/Capability Issues:

- Lack of adequate manpower
- Lack of technical expertise
- Lack of funds at ULB level
- Lack of awareness mechanism /community participation

Infrastructure related Issues:

- Collection/ Transport Equipment
- Secondary Storage Infrastructure
- Waste Processing Technology/ Infrastructure

Source: GOI-ADB-PPP Initiative-Volume 1 overview and process

Critical Success Factors for a company in this market:

- Large proportion of waste collected is usually non-revenue generating inert waste or Construction & demolition waste that needs to be incinerated or sent to landfills
- Motivating govt officials to co operate is a quite a challenge for start-ups.
- Using own channels /staff for waste collection usually turn out expensive
- Organization building and interfacing with different categories of people e.g. rag-pickers, officials, workers etc. is by no means an easy task. Particularly, a strong lobby of scrap dealers, often exploit rag-pickers (from remote areas due their lack of permanent address or identity), and buy scrap collected by them for small amounts. TM will initially need more of its own trained safai karmacharis and cannot depend upon rag-pickers till such time as Govt and NGOs provide assurance / security to Rag pickers to cooperate in the waste collection effort.
- Success of the Nisarguna Technology for the biomethanation of wastes (which generates fertilizers and biogas as outputs), to be used by TM, depends mainly on the proper segregation of kitchen waste.
- Costing & Pricing of the Wastes & the Recycled products will pose a major challenge

5.3 Historical evolution – Risks & Gaps for TM success

Specific risks that TM and its market/industry face:

- Nature of wastes being collected from the source & processing issues related to waste residue, find it *difficult to have a ready market*.
- *Adoption of the right processes and technology for effective recycle and equally lucrative markets for the residue*
- **Multiple Govt & civic authorities involved:** Urban sector is seen as a very high-risk sector and also because of institutional complexity due to multiplicity of agencies involved in service delivery. In cities like Mumbai, Chennai, Delhi, Bangalore, Hyderabad, Ahmedabad etc., garbage disposal is done by **Public Private Partnerships (PPPs)**. The private sector is involved in door-to-door collection of solid waste, street sweeping in a limited way, secondary storage and transportation and for treatment and disposal of waste. Some private firms carry out **Integrated Municipal Solid Waste Management (IMSWM)** which includes collection, segregation & transportation, treatment, compost, biomethanation, refuse derived fuel, and final disposal. However, there are **serious barriers to private sector participation** in urban infrastructure as the financial status of ULBs except for a few, is precarious.
- Further, there is **lack of a regulatory or policy enabling framework** for PPPs, barring few exceptions, and lack of bankable and financially sustainable projects considering the opportunities and risks involved. There is also a need to rationalize tariffs and user charges. However, Govt. of India has only recently taken many Policy Initiatives to promote and boost growth and sustainability of Waste Management Sector.
 - *Central Electricity Regulatory Commission has already declared Draft Norms for determination of Generic Tariff for Municipal Solid Waste/Waste to Energy Projects and Indicative Tariff for 2015-16.)*
 - *Policy regarding Subsidy on Compost produced from the Municipal Solid Waste is in final stage of approval.*
 - *Final Norms for determination of Generic Tariff for Municipal Solid Waste/Waste to Energy Projects & Tariff for 2015-16 will be declared by the Govt. of India shortly*

Likely reasons for TM to **under-achieve its targets**?

- Municipalities regulations on restriction to operate in certain locations. Outsourcing of locations for waste collection to other contractors and restrictions on using land fills might affect the plans of TGL to achieve its targets

What **steps** are being taken **to mitigate these risks**?

- TM plans to hold discussions with key government departments / municipalities and will be a first mover in the chosen territories, with the right publicity (e.g. taking photos of garbage pile-ups at various locations in the city) & targeting customers who have problems with waste disposal.

Gaps that exist in TM (Those could be in the strategy, business model, customer traction, talent, technology, operations etc.)

- Funding of Equity & Debt
- Human Resources at key administrative levels
- Permissions from various Municipalities
- Determining Logistics of operations in various states after pilot in Chennai, Tamil Nadu

6. Where will TrashMafia focus?

Total Aggregate Market (TAM)

- *CPCB estimated in 2013-14 the MSW of **144,165 MT per day was generated.** Its division into recyclable (bottles/paper/plastics/metal cans/cardboard/corrugated boxes etc.), organic and inert waste (construction/demolition waste/degraded refuse which go directly to landfills) is in the ratio 18:51:31 and various players try to address issues in only 1 sector due to lack of manpower, funds and skilled management.*

Segment Aggregate Market (SAM)

- *Of the MSW generated, 80% or 115,742 MT was collected and only 22.8% or 32,871 MT per day was treated.*

TM's Share of Market (SOM) & Segments it will focus

- **Trash Mafia (TM)** will target around **12.5% of MSW market (collection capacity of around 20,000 MT)** with an initial collection capacity of 1,500 MT (5MT/ day in a 300 working day year) in any single state for not only **recycling / sale** of products as used items, but also for treatment or **processing of wet waste into products** viz. fertilizers & manures
- **Chennai, Tamil Nadu will be the pilot for starting operations.** TM will then launch operations in 11 other State Capitals (with populations in excess of 10 million) in a phased manner (adding 1 or more states every year), eventually reaching **20,000 MT of collection capacity by year 2025**

7. Who are TrashMafia's Rivals?

Major Competitors	Competitive scenario				
	Main Business line	Geography	Customers	Key Strengths & weaknesses	Opportunities & Threats
1. Lets Recycle (NEPRA Resource Management Pvt. Ltd)	Municipal Dry Solid Waste Processing Solid Waste To Electricity.	Ahmedabad, Gujarat	Residences, Commercial, Industrial, Municipalities	<p>Strengths: Localised in Ahmedabad since 2012. It has capacity to handle 7MT per day. It has increased waste handling to 1641 MT/annum in 2014 (338% increase)</p> <p>Weaknesses: A new venture localised in Ahmedabad</p>	<p>Opportunities: Its Capacity can be increased to handle > 7MT per day. Growth by 338% between 2012-14 is positive prospect for a new entrant</p> <p>Threats: Possible new entrants in Gandhinagar</p>
2. Ramky Enviro Engineers Ltd	Solid and hazardous waste management and recycling	Headquartered at: Hyderabad	Municipalities & ULB's	<p>Strengths: Established in 1994 (22 year old co) with projects being executed at Delhi, Hyderabad, Guwahati, Mumbai etc. Possesses integrated solid waste management Technology (presently operating India's largest hazardous waste incinerator)</p> <p>Weaknesses: Capital intensive nature of projects & difficult to raise funds</p>	<p>Opportunities: Advanced Technology available. Participating as a partner in contracts with Ramki is a potential growth prospect for a new entrant like TM</p> <p>Threats: New entrants who operate in Capitals with high urban population may overthrow it</p>
3. Mailhem Engineers Pvt Ltd	Solid waste management with Biomethanation (Wet/Green garbage), Refuse Derived Fuel	Headquartered at: Pune	Municipalities & ULB's	<p>Strengths: Established since 1995 (21 year old co) working on projects in association with various municipal corporations across the</p> <p>Weaknesses: Capital intensive nature of projects & so difficult to raise funds</p>	<p>Opportunities: Advanced Technology available. Participating as a partner in contracts with Mailhem may be a</p> <p>Threats: New entrants who operate in Capitals with high urban populations may overthrow it</p>
4. Southern Cogen Systems Pvt Ltd	Solid Waste Management and Water Treatment for energy conservation. They have developed a novel pyrolysis process for energy generation from waste.	Headquartered at: Mysore, Karnataka	Municipalities & ULB's	<p>Strengths: Their patent pending pyrolysis process has the ability to process a wide variety of waste including MSW, biomass, bio-solids, tyres, sludge, plastics, wood, etc.</p> <p>Weaknesses: Capital intensive and patent pending. Far away from city</p>	<p>Opportunities: Advanced technology in village area can improve social acceptance and reduce operating costs</p> <p>Threats: Entrants with similar technology in city area</p>
SELCO International Limited	Integrated Municipal Solid Waste Processing Solid Waste To Electricity	Headquartered at: Hyderabad	Municipalities & ULB's	<p>Strengths: The company produced 6.78 MW electricity from RDF process in 2003 and has synchronized with the grid to generate 145 million units of Electricity till date.</p> <p>Weaknesses: No other byproduct obtained and operating costs high</p>	<p>Opportunities: Can partner with TM to generate more power at lower costs</p> <p>Threats: May lose market share in W2W market as no control in MSWM supply</p>

8. Key Products/Services

Key Product Sales/Services (Revenue Streams):

- **TrashMafia App Services:** Households, offices, leisure places, shops etc. seeking waste clearance services, can register online and provide personal details. They will be given options to choose monthly/quarterly/half-yearly subscription fees (which could be paid through debit/credit card/net-banking or Cash-on-collection). On payment of fees, they could opt for buying plastic cans according to their requirements (e.g. 5KG/10KG/15KG/20KG with or without wet & dry waste partitions). They can choose the frequency at which they want trash to be collected from their place. Alongside them, industrial customers in need of segregated waste can register on the portal and ask for types of waste they need. This service can be asked for at a week's notice and based on available stock of the recyclable material, we charge customers a premium. We also post weekly articles & news on our website's knowledge base to inform users about the status of MSWM in India and abroad and upcoming technologies. We also show each user how much waste & money he is saving based on his subscription package and amount of waste he sends to us. He uses the trashcans and we collect it from him without much effort.
- **Plastic Cans** (for collection/segregation of waste): They are available as part of the subscription and are segregated to allow users to easily throw waste as per the type. They are well designed to instigate the sense of responsibility towards our environment in customers who purchase them. These allow easy sorting and collection of waste by workers and trucks to be sent to corresponding ULBs.
- **Biomethanation Services:** A key differentiating factor between us and other players is in this domain, where we actively enter the supply chain of waste-to-wealth industries. We tap into our expertise with the Nisargaruna Technology to convert the large quantity of organic waste into usable fertilizers and biogas for cooking and even local electricity generation. This service is an initiative to give rural employment and basic needs to villages while tapping into the vast potential of waste conversion to get profits on outputs sold. We believe that this would give customers more faith in our ethics and company belief, hence leading to improved sales.

9. TM's Business Model – Business Development strategy

- **Communities as a whole would be targeted** in preference to only a few individual households/corporates, keeping in mind the waste handling capacity constraints. Initially around 500-600 customers who generate waste on a regular basis, will be signed up for renewable monthly/quarterly/annual contracts. They will be provided with partitioned plastic trash cans for segregating wet & dry waste. (An average collection of 10Kg per day from each of the 500 customers would enable TM to achieve its waste collection target of 5MT/day). We want to position ourselves as a modern solution for all classes of mankind to save Mother Earth, and focus on how they can do it easily by taking our services. TM would **hire an agency for initial marketing** and start publicity & awareness campaigns through **road shows, newspaper ads, rallies, public debates, design competitions and conventional TV**, in each city encouraging customers to sign up & register with their names, address & contact phone nos. on TM's App. Before going to direct marketing, TM will build its credibility by providing loyalty programs to customers, participating in accelerator programs and awards for start-ups and necessary certifications from governments/environmental organizations. TM would look for bulk orders from institutions & companies before moving to the citizen segment to ensure regular cash flows for larger scaling.
- Feedback from customers would be built in to the **TrashMafia App**. Although there could be minor hiccups in service quality initially, TM would continue with its work ethic, because experience gained, will result in lower future development costs. As such cloud services and servers wouldn't suffer from large traffic because of the subscriptions available only on periodic basis. We wouldn't require much expenditure in that domain.
- System flexibility of the App is of very low requirement as waste collection is a static requirement and only the type of waste changes. Future App development wouldn't be of high cost and the only requirement in the future would be the ability to scale up collection facilities and worker numbers and plastic can production. Referrals from existing customers will be linked to App which facilitate sharing information by customers of their experiences and spreading awareness of our product.
- **Digital media marketing** e.g. online campaigns through websites & blogs will help to generate awareness of households, office places, leisure places, shops etc. in capitals

9.1 TM's Business Model – Organisation & Management

Strategic Level:

- The founders will hire MSWM **teams** comprising following key personnel (in each state) who can demonstrate strong ethical standards, entrepreneurial mindset, a history of achievements and formidable domain expertise. We will form strategic partnerships with **private firms in possession of advanced treatment technologies (MSWM) & BARC** to grasp greater sections of the value chains.

Operations/Administrative level:

- **TM** will employ around 25 safai karmacharis (15 own & 10 ragpickers) at each state capital, who would be supervised by another 25 support staff for administrative and operational duties at the plant.
- Administration & Financial Managers with 5+ years experience in the MSW collection & disposal departments of leading companies
- Marketing /Sales Managers with 5+ years experience in MSWM at Plant level
- General Managers with 10 +years experience in the MSW recycling at Plant level
- Plant Managers with 10+ years experience in the MSW recycling at Plant level

TM's Pricing Approach:

- Industrial customers are willing to pay a premium to get segregated waste and a suitable pricing mechanism should be devised for users of recyclable waste, keeping in mind varying costs and keeping profit margins.
- Pricing could be dynamic by having a system of tracking current market trends (e.g obtaining quotations from dealers) of recyclable items/byproducts generated from waste. Research on demands from customers will determine take on while keeping prices competitive to improve customer confidence.

10. Financials – 15 year Profit & Loss Accounts															
TM consistently makes profits starting from Year 4															
Year	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Revenues / Cash flows	53,67,331	132,34,663	236,01,994	437,63,190	622,03,988	836,44,785	1170,92,714	1468,20,245	1797,97,776	2326,42,638	2751,56,901	3211,71,165	3441,11,963	3441,11,963	3441,11,963
5 Kg cans X no of states	2,50,000	10,00,000	22,50,000	48,00,000	75,00,000	108,00,000	159,25,000	208,00,000	263,25,000	350,00,000	423,50,000	504,00,000	540,00,000	540,00,000	540,00,000
TrashMafia App Subscription	10,00,000	40,00,000	90,00,000	192,00,000	300,00,000	432,00,000	637,00,000	832,00,000	1053,00,000	1400,00,000	1694,00,000	2016,00,000	2160,00,000	2160,00,000	2160,00,000
Recyclable waste sale proceeds	5,40,000	10,80,000	16,20,000	25,92,000	32,40,000	38,88,000	49,14,000	56,16,000	63,18,000	75,60,000	83,16,000	90,72,000	97,20,000	97,20,000	97,20,000
Bio Gas Revenues	7,48,744	14,97,488	22,46,231	35,93,970	44,92,463	53,90,955	68,13,568	77,86,935	87,60,302	104,82,413	115,30,654	125,78,895	134,77,388	134,77,388	134,77,388
Manure Revenues	3,32,775	6,65,550	9,98,325	15,97,320	19,96,650	23,95,980	30,28,253	34,60,860	38,93,468	46,58,850	51,24,735	55,90,620	59,89,950	59,89,950	59,89,950
Saving in Org Waste tht wud be dumped	24,95,813	49,91,625	74,87,438	119,79,900	149,74,875	179,69,850	227,11,894	259,56,450	292,01,006	349,41,375	384,35,513	419,29,650	449,24,625	449,24,625	449,24,625
(Value placed on waste which we obtained free of cost)															
Less:															
Costs	14,87,625	32,75,250	53,62,875	93,00,600	125,25,750	161,10,900	217,27,388	263,91,300	314,45,213	397,26,750	460,09,425	527,12,100	564,77,250	564,77,250	564,77,250
5 Kg cans X no of states	1,50,000	6,00,000	13,50,000	28,80,000	45,00,000	64,80,000	95,55,000	124,80,000	157,95,000	210,00,000	254,10,000	302,40,000	324,00,000	324,00,000	324,00,000
Org Waste transpt chgs to Biometh plant	8,31,938	16,63,875	24,95,813	39,93,300	49,91,625	59,89,950	75,70,631	86,52,150	97,33,669	116,47,125	128,11,838	139,76,550	149,74,875	149,74,875	149,74,875
Cost of transpting inert waste to landfills	5,05,688	10,11,375	15,17,063	24,27,300	30,34,125	36,40,950	46,01,756	52,59,150	59,16,544	70,79,625	77,87,588	84,95,550	91,02,375	91,02,375	91,02,375
Less:															
Organisatin & Management (G&A) exp.	13,97,500	55,90,000	125,77,500	223,60,000	349,37,500	503,10,000	684,77,500	894,40,000	1131,97,500	1397,50,000	1690,97,500	2012,40,000	2012,40,000	2012,40,000	2012,40,000
(5% of Capital Investment)															
Income before D&A and Interest	24,82,206	43,69,413	56,61,619	121,02,590	147,40,738	172,23,885	268,87,827	309,88,945	351,55,063	531,65,888	600,49,976	672,19,065	863,94,713	863,94,713	863,94,713
Less:	15,38,848	28,08,166	40,77,485	53,46,804	66,16,123	78,85,442	91,54,760	104,24,079	116,93,398	129,62,717	142,32,035	155,01,354	155,01,354	155,01,354	155,01,354
Depreciation (17% of Capital investment)	11,80,814	24,50,133	37,19,452	49,88,771	62,58,089	75,27,408	87,96,727	100,66,046	113,35,364	126,04,683	138,74,002	151,43,321	151,43,321	151,43,321	151,43,321
Amortization of pre-operating exp.(8 yrs)	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033
Income before interest	9,43,359	15,61,246	15,84,134	67,55,786	81,24,615	93,38,444	177,33,067	205,64,866	234,61,665	402,03,171	458,17,941	517,17,711	708,93,358	708,93,358	708,93,358
Interest expense	4,00,000	42,42,200	42,42,200	33,71,650	24,51,100	15,20,550	5,50,000	3,70,000	1,90,000	0	0	0	0	0	0
Net Income	5,43,359	(26,80,954)	(26,58,066)	33,84,136	56,73,515	78,17,894	171,83,067	201,94,866	232,71,665	402,03,171	458,17,941	517,17,711	708,93,358	708,93,358	708,93,358
Cash Profits	20,82,206	1,27,213	14,19,419	87,30,940	122,89,638	157,03,335	263,37,827	306,18,945	349,65,063	531,65,888	600,49,976	672,19,065	863,94,713	863,94,713	863,94,713
Financial analysis:															
IRR	29%														
Return on equity	1%	-7%	-6%	8%	14%	19%	42%	49%	57%	98%	112%	126%	173%	173%	173%
Return on investment	1%	-3%	-3%	4%	6%	9%	19%	22%	26%	44%	50%	57%	78%	78%	78%

10.1 Financials – 15 year Projected Cash Flow Summary & Returns

TM generates an Internal Rate of Return (IRR) of 29% over a 15 year term and a 69% Return on Equity & 31% Return on Investment

Year	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cash Inflow															
Financial Resources															
Equity	246,24,000	164,16,000													
Loans IDBI	80,00,000	120,00,000													
Commercial Loans		301,60,000													
Net income (loss) from Operations	5,43,359	(26,80,954)	(26,58,066)	33,84,136	56,73,515	78,17,894	171,83,067	201,94,866	232,71,665	402,03,171	458,17,941	517,17,711	708,93,358	708,93,358	708,93,358
Add back:															
Depreciation	11,80,814	24,50,133	37,19,452	49,88,771	62,58,089	75,27,408	87,96,727	100,66,046	113,35,364	126,04,683	138,74,002	151,43,321	151,43,321	151,43,321	151,43,321
Amortization- Pre-opening expense	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	3,58,033	0	0	0
Interest expense	4,00,000	42,42,200	42,42,200	33,71,650	24,51,100	15,20,550	5,50,000	3,70,000	1,90,000						
Total Cash Inflow	351,06,206	629,45,413	56,61,619	121,02,590	147,40,738	172,23,885	268,87,827	309,88,945	351,55,063	531,65,888	600,49,976	672,19,065	860,36,679	860,36,679	860,36,679
Cash Outflow															
Investments including Replacements															
(a) Building and Construction	4,06,000	1,74,000													
(b) Design, Engineering & Supervisi	14,278	6119.10													
(c) Project Equipment	10,67,500	4,57,500													
Replacement of Factory Equipment															
(d) Furniture, and Office System Cost		6,75,000													
(e) Vehicles		42,50,000													
2.1 Pre-Operating Expense	3,13,279	1,34,263													
Salvage value															
Debt Service															
Interest payment	(4,00,000)	(42,42,200)	(42,42,200)	(33,71,650)	(24,51,100)	(15,20,550)	(5,50,000)	(3,70,000)	(1,90,000)						
Loan repayments	0	0	(87,40,000)	(97,40,000)	(99,40,000)	(107,40,000)	(36,00,000)	(36,00,000)	(38,00,000)						
Total Cash Outflow	14,01,057	14,54,682	(129,82,200)	(131,11,650)	(123,91,100)	(122,60,550)	(41,50,000)	(39,70,000)	(39,90,000)	0	0	0	0	0	0
Net Cash Flow	337,05,149	614,90,731	186,43,819	252,14,240	271,31,838	294,84,435	310,37,827	349,58,945	391,45,063	531,65,888	600,49,976	672,19,065	860,36,679	860,36,679	860,36,679
Cumulative Cash Flow	337,05,149	951,95,880	1138,39,699	1390,53,939	1661,85,776	1956,70,211	2267,08,038	2616,66,983	3008,12,046	3539,77,934	4140,27,910	4812,46,975	5672,83,654	6533,20,334	7393,57,013
Financial Analysis:															
Internal Rate of Return															
Year	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Cost	(351,06,206)	(629,45,413)													
Net Cashflow from operation	14,01,057	14,54,682	186,43,819	252,14,240	271,31,838	294,84,435	310,37,827	349,58,945	391,45,063	531,65,888	600,49,976	672,19,065	860,36,679	860,36,679	860,36,679
Salvage Value (assumed nil)															0
Total	(337,05,149)	(614,90,731)	186,43,819	252,14,240	271,31,838	294,84,435	310,37,827	349,58,945	391,45,063	531,65,888	600,49,976	672,19,065	860,36,679	860,36,679	860,36,679
Internal Rate of Return (IRR)	29%														
Return on equity (ROE)	69%														
Return on investment (ROI)	31%														

The Total initial Capital Investment for this venture is estimated at Rs 912 lacs for 12 states (or Rs 76 lakhs per state)

Estimated Capital Investment Requirement (for each state)		12 states
Capital Investment		
	Estimated Costs (Rs)	Total Inv (Rs)
1. Fixed Investment (See 1.1 below)	70,50,397	
2. Pre-operating Expense (See 2.1 below)	4,47,542	
3. Pre-operating interest expense (see 3.1 below)	21,936	
4. Working Capital (see 4.1 below)	31,500	
Total Investment Cost	76,00,000	9,12,00,000

10.2.1 Financials – Capital Investment (per State)

1.1 Fixed Investment - Grand total (a+b+c+d+e+f)			70,50,397
(a) Building and Construction	Area sft	Cost per m2	Estimated Costs (Rs)
Plant Building/Erection	7,500	55	4,12,500
Steel Structure Frames (Ton unit)	500	75	37,500
Adminstration Building	1,000	50	50,000
Warehouse Building	1,500	40	60,000
External Work	1,000	20	20,000
Contingency (5%)			0
Total Building and Construction			5,80,000
(b) Design, Engineering & Supervision (DES) Costs	% of Construction Cost		Estimated Costs (Rs)
Plant Engineering Design	included in equipment cost		0
Building Design	5.0%	Tot Adm & Wareh	5,500
Building Supervision	2.5%	Tot Bld & const	14,500
Other Expenses (1% of the above)	1.99%		397
Total DES Costs			20,397
(c) Project Equipment			Estimated Costs (Rs)
Melting Process Machinery(C&F)			7,50,000
Rolling Machinery (C&F)			2,50,000
Shredder Machine			2,00,000
Heavy Duty Press			1,50,000
Miscellaneous Equipment (locally purchased)			1,00,000
Supervision & Comissioning			75,000
Contingency (2%)			0
Total Project Equipment			15,25,000
(d) Furniture, and Office System Cost	Nos	Avg rate	Estimated Costs (Rs)
Furniture			0
Office Equipment			2,00,000
Smart Phones & Related Software	40	7,500	3,00,000
Computers/ App Software development	5	25,000	1,25,000
Contingency			50,000
Total Furniture and office system cost			6,75,000
(e) Vehicles	Nos	Avg rate	Estimated Costs (Rs)
Dumper Trucks (about 1 MT capacity)	10	3,00,000	30,00,000
Tricycles / Hand Carts	45	10,000	4,50,000
Overhead Cranes (30/ 10 class 4)	1	2,50,000	2,50,000
Forklift	2	75,000	1,50,000
Company Cars	1	4,00,000	4,00,000
Total Vehicles cost			42,50,000

Details of the Fixed initial Capital Investment is Rs 70.5 lakhs as below

10.2.2 Financials – Capital Investment (per State)

2.1 Pre-Operating Expense		Estimated Costs (Rs)
Establishment Expense		50,000
General Administrative Expense		75,000
Consultant Fee % of Total Capital/ Invst	1.0%	70,504
Financial Consultant Expense		25,000
Freight Inspection & Local transport (1%)	1%	15,250
IDBI Commitment Fee	1%	2,00,000
Other Expenses (5%)	5%	11,788
Total Pre-Operating Expense		4,47,542

3.1 Interest during construction	Estimated Costs (Rs)
Interest during construction (estimated)	21,936

4.1 Working Capital	
Current Assets	
Receivables = 15 days Sales	12,500
Inventories = 15 days Purchases	7,500
Cash = 15 days x (cans Purchase Cost + Org & Mgt expenses)	26,500
	46,500
Current Liabilities	
30 days Purchase	15,000
Total Initial Working Capital Requirement	31,500

Details of the Pre-operating Expenses, Interest during Construction period & Working capital estimates are shown below:

10.3 Financials – Manpower Requirement & Cost (Per state)

TrashMafia Estimate of Manpower Requirement and Cost (for each state)

Manpower	Cost/ Month (Rs)	No. of Worker	Bonus/year (Rs)	Cost/Year (Rs)
Adminstration		9	29,500	4,22,500
General Manager	6,000	1	6,000	78,000
Driver	3,000	1	3,000	39,000
Adminstration & Financial Man	5,000	1	5,000	65,000
Accountants	3,000	2	3,000	78,000
Personnel Staff	3,000	1	3,000	39,000
Computer Technicians	3,000	1	3,000	39,000
Marketing/SM for Recy wst	4,000	1	4,000	52,000
Store Keepers	2,500	1	2,500	32,500
Operations		38	29,000	9,75,000
Trash Collectors	1,500	15	1,500	2,92,500
RagPickers	1,000	10	1,000	1,30,000
Forklift Operators	3,000	1	3,000	39,000
Plant Manager	6,500	1	6,500	84,500
Operators	2,500	3	2,500	97,500
Electrical Technicians	3,000	1	3,000	39,000
Drivers	4,000	3	4,000	1,56,000
Watchman	3,000	2	3,000	78,000
Helpers	2,000	1	2,000	26,000
Time Keepers	2,500	1	2,500	32,500
Rounding				
Total		47	58,500	13,97,500

An estimated total manpower of 47 persons at an estimated cost of approx. Rs 14 lakhs is requires per state

10.4 Financials – Sources of Finance for Total Investment

Proposed Sources of Finance for a Total Capital Investment for 12 states (Rs 912 lakhs) is presented below:

TrashMafia

Sources of Finance for Total Investment of 912 lakhs

Total Investment	9,12,00,000		
Equity (Promoters & Venture Capitalists)	45%	4,10,40,000	
Term Debt IDBI (or other Industrial development Banks)	22%	2,00,00,000	
Commercial Loans from Banks/ Fin Inst	33%	3,01,60,000	
Year	1	2	Total
Equity Capital	2,46,24,000	1,64,16,000	4,10,40,000
Term Debt IDBI (or other Industrial development Banks)	80,00,000	1,20,00,000	2,00,00,000
Commercial Loans from Banks/ Fin Inst		3,01,60,000	3,01,60,000
Total	3,26,24,000	5,85,76,000	9,12,00,000
Equity Distribution		Proposed share	
Total Equity	4,10,40,000		
Promoters Contribution	5,59,447	1.4%	
Affiliates or Group Co of Promoters. proposed Investment	51,30,000	12.5%	12.50%
Remaining Fund to be raised through Venture Capitalists	3,53,50,553	86.1%	of project equity
	4,10,40,000	100%	