



Waste to Wealth Solutions for a Sustainable Future

A CASE STUDY OF LEADING “FOR PROFIT” BUSINESSES
ENGAGED IN WASTE RECYCLING

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Author's note

**“The human race is challenged more than ever before to demonstrate our mastery
– not over nature but of ourselves.”**

Every morning, I leave home to go to school at around 7:00 am. Looking outside the car window at around 7:15 am, I see a tyre retail shop with waste tyres lying around in stock piles.



After about 5 minutes, I drive past a solid waste dump site, where an entire neighborhood's waste is collected for a weekly pick-up by municipal authorities.



Around 1 kilometer ahead of the dumpsite is a scrap dealer for end of life cars. There, I always see abandoned vehicles which have been discarded and left to rust away.



These aren't pleasant sites. While it may not seem so, these images have been captured in one of the nicer areas of New Delhi. This intrigued me and made me curious to find out what actually happens to end of life goods that we generate in our every day life. This curiosity is the inspiration behind my research report.

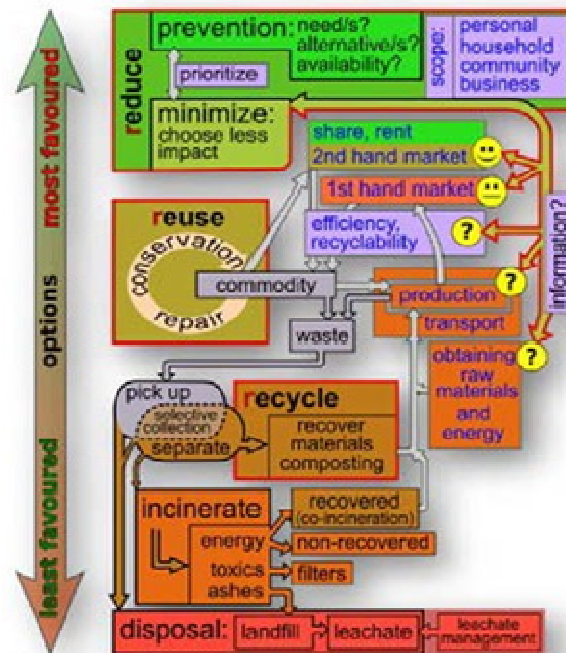
Introduction

According to The Press Information Bureau, as of 2019, approximately 62 million tonnes of solid waste is generated annually in India. Of this, alarmingly, only 9.3 million tonnes (15% of the total) is recycled and converted to reusable products.

With a population of 1.34 billion people and growing, India, comprising only 2.4% of the earth's land area, is home to almost 18% of the world's population. The country's 1.1% annual population growth rate has led to great pressure on the country's natural resources. It has also impacted waste management planning and implementation in two different ways.

Firstly, more people equals more waste being generated. India's 1.1% annual population growth rate has led to a 4% increase per annum in waste generation.

Secondly, in needing to provide for a growing population, the Indian government has prioritized providing access to resources such as food, electricity, and water. While these are all important areas to address, it also means that waste generation and management has been largely overlooked at the government level.



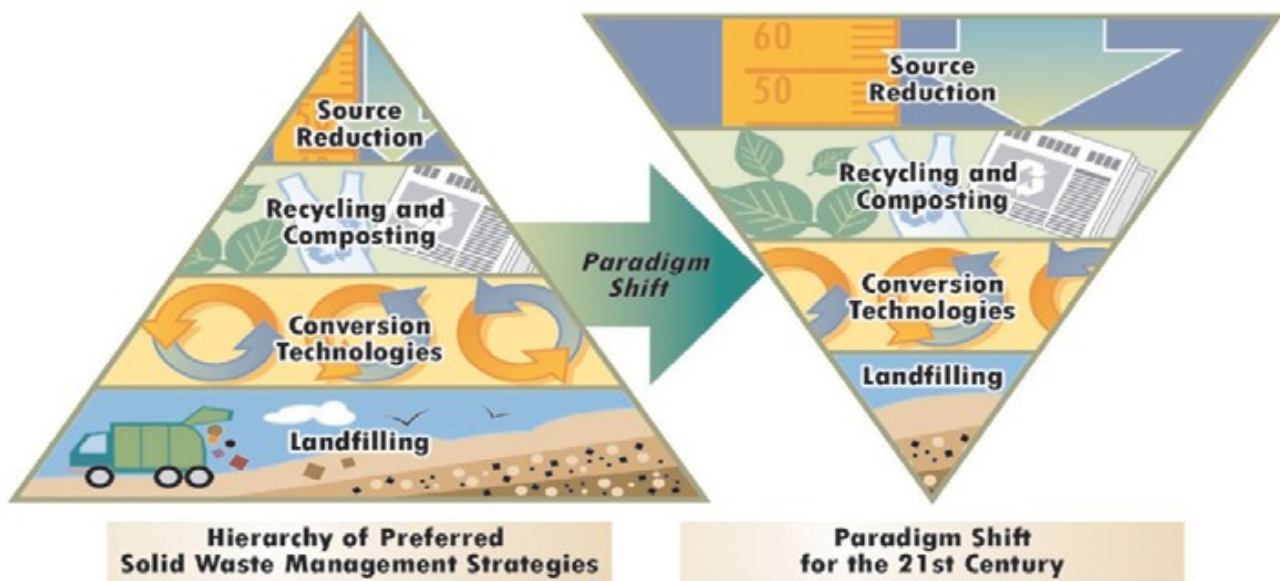
The government's effort in waste management is largely undertaken at the municipal level, where Municipal Authorities provide Solid Waste Management (SWM) services with an aim to keep Indian cities clean. But experts and critics of the system believe that there are flaws.

A report by Samar Lahiry suggests that approximately 80% of solid waste found in India's dump yards or landfills has the potential to be recycled, if rag pickers were instructed on the correct steps to segregate the waste. The key to efficient waste management is to ensure segregation at source and resource recovery.

The consequences of India's 62 million tonnes of annual waste generation are truly concerning. Typhoid, cholera, dysentery, yellow fever, encephalitis, plague and dengue fever are just a few of the human diseases linked with imprudent waste management and garbage burning. Aside from causing human diseases, garbage burning is also one of the country's most significant producers of greenhouse gas emissions, including carbon monoxide, nitrogen dioxide, carcinogenic hydrocarbons and other polluting gases that are released in the process.



Policy Measures



To improve the conditions of waste management in India, the Union Ministry of Environment, Forests and Climate Change introduced Solid Waste Management Rules (SWM) 2016. These are an improved, updated version of the Municipal Solid Wastes (Management and Handling) Rules, initially introduced in 2000.

The updated rules are applicable not just in municipal cities and towns, but also airports, airbases, ports and harbours, railways, special economic zones (SEZs), defence establishments, places of pilgrimage, religious and historical importance, government organizations, urban agglomerations, census towns and notified industrial townships. Some important features of the new waste management rules include:

- ✓ Mandatory source segregation of waste to convert waste to wealth through recovery, reuse and recycle.
- ✓ Special guidelines for storage and disposal of construction and demolition waste.
- ✓ Manufacturers of disposable products using plastics, tin, glass, etc. are mandated to provide financial help to local authorities for the implementation of waste management systems.
- ✓ Manufacturers of single-use, non-biodegradable products are required to have a system in place to recollect the packaging waste generated during production.
- ✓ Biodegradable waste must be processed, treated and disposed of using bio-methanation or composting within the area of production. The remaining waste should be treated under guidelines of the local authority.
- ✓ Throwing, burying or burning of solid waste on streets, water bodies or any open spaces is not permitted.
- ✓ Ragpickers should be integrated into the formal economy by the State Governments or Self-Help Groups.

Even with the introduction of these Solid Waste Management Rules, flaws in implementation are extremely common as the government fails to incentivise and impose stringent penalties for poor implementation.

Green Business Solutions to Waste Management

Mr. Chaitanya Kalia (Climate Change and Sustainability Services at Ernst & Young Associates) stated that 'For any model to succeed, it has to be woven around business.' This made me wonder about the role of private enterprises in waste management and recycling in India, especially to fill the gaps where government policy and implementation fall short. I realized unless the solution to waste has a strong “For Profit” scope. It will not be sustainable.

To learn more about this, I conducted interviews with three private organizations whose business models are structured around different forms of waste management and recycling.

<p>Tinna Rubber & Infrastructure Ltd 6, Sultanpur Mandi Road, Mehrauli, New Delhi 110030</p>	<p>Karo Sambhav Pvt Ltd 408 & 409, Fourth Floor Suncity Business Tower Sector 54, Golf Course Road Gurugram, Haryana 122002</p>	<p>Gravita India Limited A-27-B, Shanti Path, Tilak Nagar, Jaipur 302004</p>
 <p>TINNA RUBBER AND INFRASTRUCTURE LIMITED (TRIL), setup three decades ago is an end-to-end solutions company in the business of waste tyre sourcing, processing and manufacturing of value-added products derived from Waste Tires/ ELT.</p>  <p>www.tinna.in</p>	 <p>KARO SAMBHAV translates into ‘Make Possible’ and as India's leading Producer responsibility organization (PRO) are steering the way e-waste is managed in this country by putting accountability, transparency and trust in the system.</p>  <p>www.karosambhav.com</p>	 <p>GRAVITA is one of the largest recyclers of non-ferrous metals in India. The company is dedicated to lead and lead products with an environment friendly process.</p>  <p>www.gravitaindia.com</p>

Tyre Industry & Waste Tyre Generation in India

India currently produces about

650,000 TYRES

and discards

275,000 TYRES

everyday.

Rubber Asia observed that India generates over

1 MILLION TONS

of ELTs each year.

6 %

of ELTs generated globally from
India.

It is estimated that

60 %

of waste tyres generated in India
are disposed of through illegal
dumping.



Tinna Rubber & Infrastructure Limited was setup 3 decades ago and is among the largest recyclers of waste tyres in India.

Interview Responses

TINNA RUBBER & INFRASTRUCTURE LTD (INTERVIEW WITH MR. NJ CHATERJEE)

Tinna Rubber and Infrastructure Limited is a fully integrated company converting waste tyres into downstream value-added products. The company lays strong emphasis on the utilization of modern technology for qualitative services and business efficiency.



Q1 *Please explain your business model*

We are in the business of waste tyre recycling. We essentially take waste tyres, aggregate them from within India and also import them from across the world, primarily from the Middle East, Europe, U.S, and Australia and recover materials from these tires. The recovered materials are treated in a way that they can go back to make new products

Q2 *How long has your company been operating for?*

Our company has been in business for almost 4 decades but got into the recycling of tyres only 6 years ago.

Q3 *Was the business started with an environmental approach in mind, or was it an additional aspect that became prominent in the business?*

To be honest, for us, tire recycling came out of a need to backward integrate our business. We are not getting desired quantity and quality of recycled rubber, so decided to process waste tyres ourselves.

Q4 *What is the environmental impact of your process? What measures does your business take to tackle waste management?*

When we recycle waste tyres, we are able to recover 100% of the material from the tyre, therefore we don't have any waste. Typically, in a truck and bus radial tyre, there is 75% rubber 25% steel. Also, our process is completely mechanical and does not generate any fumes or effluent therefore there is neither any air nor water pollution.

Q5 *Does being a 'green business' add additional costs compared to regular businesses?*

Yes, in order to be a fully compliant green business, it does add some extra cost. However, as a conscious global citizen, we would not operate any other way and our customers value this approach.

Q6 *Please explain the revenue model for your business.*

As mentioned earlier, we recover the rubber and steel from waste tyres. Firstly, about rubber: the rubber is processed into various forms of raw material, and depending on the final product, customers choose the right product that works for them. For example, low-performance rubber products like snow mats, sports tracks and rubber tiles can use a very basic form of recycled material which is lower in value. On the other hand, high-performance rubber products like tyres, conveyor belts, brake pads use fine quality of recycled material which costs more. Overall, this business can operate at around 12-15% EBITDA (earnings before interest depreciation tax and amortization). The one big distinction between tyre recycling in India vs developed countries is that in India, we have to pay for tyres, but in countries like the USA and most European countries, tyres are available to recyclers free of cost, along with some subsidies.

Q7 *Is the current political environment in India conducive to the waste work you do?*

India does not have a material recycling policy as of now. However, I believe a draft policy has been prepared by Niti Aayog (the equivalent of planning commission of India) and the same has referred to the cabinet for approval. Once this policy comes into place, it will greatly help companies like us who are in the recycling business.

Q8 *Are there policies in place that support or incentivize rubber recycling?*

Not as of now. There are no such policies in India.

Q9 *What do you foresee as the greatest challenges for waste management and recycling for your business in India?*

Our greatest challenge is to aggregate waste tyres. Because of the lack of policy on recycling, there is no organized collection of waste tyres. Also, due to lax enforcement of environmental laws, a very large percentage of waste tyres generated are used for converting them into heating oil in highly polluting plants.

Q10 *What do you think are the greatest opportunities?*

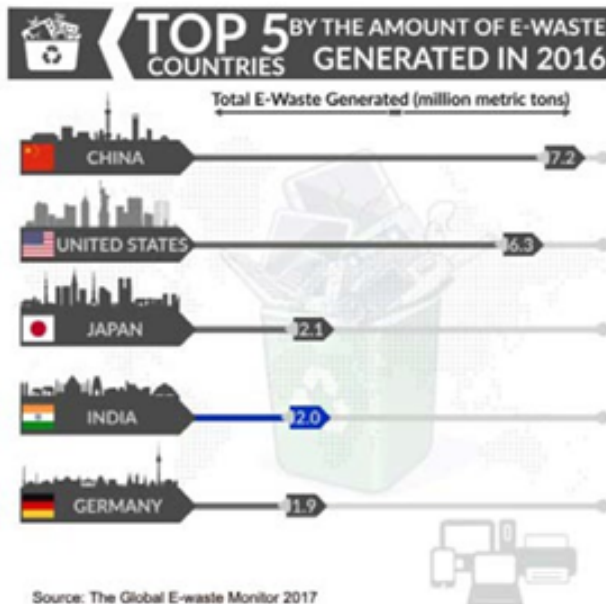
India is the second largest producers of waste tyres in the world. Therefore, not only does generate a very large quantity of waste tyres, but it also has a very large manufacturing base for manufacturing of other rubber related industries/ therefore, India provides a massive opportunity in tyre recycling.

Q11 *Do you think that 'green businesses' will become the norm in the future in India?*

Absolutely. I am convinced that this will happen, and it is just a matter of time. As awareness increases among people to treat our environment with respect and with the right government policy, and with increasing awareness that we only have finite resources, this type of business is poised for very high growth in the coming years.

Waste from Electrical and Electronic Equipment in India

2,000,000
Electronic Waste
and recycled only
40,000
everyday.



The Combined Annual Growth Rate

30 %

Of E-Waste Generation.

According to Global E-Waste Monitor

44.7 Million
Metric Tonnes

of electronic waste was produced globally
in 2016.

This is the equivalent of almost

4,500
Eiffel Towers

The Karo Sambhav ecosystem, built in sync with the diverse needs of multiple stakeholders in e- waste management, is growing and affecting change through five comprehensive outreach programs



Interview Responses

KARO SAMBHAV

(INTERVIEW WITH MS. RITIKA JAIN)

Karo Sambhav is India's leading Producer responsibility organization (PRO), specializing in e-waste management. At the heart of Karo Sambhav's approach is the creation of inclusive, sustainable, scalable and transparent systems for e-waste handling in India, which creates equitable opportunity and fair value for every stakeholder in the value chain. Their country wide grassroots driven ecosystem connects all the stakeholders into an integrated formalized e-waste management chain, transforming waste management into an environmentally conscious and sustainable industry.



Q1 Please explain your business model and how you got into this business?

Karo Sambhav is an environmentally beneficial and socially responsible Producer Responsibility Organization (PRO) with an India-wide presence. We provide responsible solutions for awareness, collection and recycling of e-waste to a range of electronics brands.

- ★ Develop and implement programmes across India which engage and inspire people to recycle e-waste.
- ★ Set-up effective collection channels across India.
- ★ Collect and procure e-waste from various channels that have been set and enable the meeting of compliance targets for the producers who are members.
- ★ Ensure responsible recycling of the collected e-waste by working with authorized responsible recyclers selected after thorough assessments
- ★ Generate auditable datasets on all the work that has been done.

In order to do the above, we are leveraging the existing channels to design a unique system where we play the role of an ecosystem enabler and to ensure transparency and ease of transactions, we are using technology such as a mobile phone application.

Q2 How long has your company been operating for?

Since 2017 (2+ years).

Q3 Was the business started with an environmental approach in mind or was it an additional aspect that became prominent in the business?

Karo Sambhav is working with several responsible brands of electrical and electronic equipment (EEE) to fulfil their compliance requirements and build an environmentally and economically sustainable ecosystem for e-waste management in India by collaborating with key stakeholders. The business was started with an environmental as well as a socially beneficial approach.

Q4 *What is the environmental impact of your process? What measures does your business take to tackle waste management?*

Our approach to e-waste management includes:

- * Consumer awareness activities
- * Collection and channelization of e-waste in an environmentally sound manner with responsible recyclers
- * Providing better livelihood opportunities to the informal sector

Q5 *Does being a 'green business' add additional costs compared to regular businesses?*

We work with verified and responsible recyclers only, which are difficult to find in all parts of the country. The entire system across the verticals is made from scratch, as there has been no precedence of handling e-waste at this scale earlier, at the PRO level. Ours is a green business by its very basic design. We are building relationships and formalizing the informal sector by working at the grassroots level to build awareness on the topic of e-waste. We are building the capacity of the unorganized & informal waste pickers who go door to door for waste collection. Through social media and digital campaigns, we are working to bring about a change in consumers' mindset towards e-waste management. As all of this is fairly new, it does lead to higher operational costs overall.

Q6 *Is the current political environment in India conducive to the waste work you do?*

There is a lot more awareness and debate on the subject of waste management which is conducive to our work. The current governmental projects are in line with our ideas to transform the e-waste sector. Please see the latest news of E-waste management Rules in India.

Q7 *Are there policies in place that support or incentivize e-waste recycling?*

Not at present.

Q8 *What do you foresee as the greatest challenges for waste management and recycling for your business in India?*

Illegitimacy in the e-waste sector is leading to a lack of fair playing field for electronics producers (who are our main clients). Availability of recycling infrastructure for e-waste in India is limited and Standard process of operation are not set for monitoring the overall processing of e-waste. This lack of checks and balances in the system leads to reduced transparency or accountability. Limited Subject Matter Expertise and awareness is also an issue. Bulk consumers of electronics (i.e. offices, colleges, institutions etc.) are not aware of their responsibilities and do not engage with e-waste issues with PROs.

Q9 *What do you think are the greatest opportunities?*

The opportunity to create a new system and aid behavioral change towards e-waste management in India.

Q10 *Do you think that 'green businesses' will become the norm in the future in India?*

We sincerely hope so! With increased awareness and various social ventures, the future looks bright.

“The e-waste stream is expected to turn into a torrent as the World upgrades to 5G.”

– Alana Semuels

Battery and Lead Waste Generation in India

Annually, more than
**15 BILLION
BATTERIES**

of all kinds are used across the world.

All batteries are recyclable and lead batteries are
99% RECYCLABLE

Lithium-ion battery recycling
in India to become a
\$1000 MILLION
opportunity by 2030.



Gravita India Ltd offers eco-friendly lead battery recycling technology / turnkey solutions to new entrepreneurs that start from waste battery collection to 99.97% LME grade refined lead.

Interview Responses

GRAVITA INDIA LIMITED (INTERVIEW WITH MR. NITIN GUPTA)

Gravita is India's leading secondary lead producer. The company's prime objective is to save mineral resources through maximizing the recovery of lead metal from scrap while ensuring environmental compliance. Gravita's energy efficient eco-friendly recycling operations plays a vital role in safeguarding resources and managing scrap/waste efficiently.



Q1 Please explain your business model and how you got into this business?

GRAVITA is one of the largest recyclers of non-ferrous metals in India. Established in 1992 and having its headquarters at Jaipur, GRAVITA is anchored by around 250 forward-looking professionals and employees more than 1000 people. GRAVITA, today has diversified into Manufacturing, International Trade, Turnkey Solutions in nonferrous metals, Plastics industry and in Information Technology. It has its offices and plants in India, USA, Singapore, Netherland, Sri Lanka, Ghana, Mozambique, Senegal, Tanzania, Jamaica, Mali, Mauritania, and Nicaragua.

Q2 How long has your company been operating for?

The company is operating since 1992 and it's been more than 26 years.

Q3 Was the business started with an environmental approach in mind or was it an additional aspect that became prominent in the business?

Yes, since inception we are doing business with an environmental approach in mind and we are doing recycling in an eco-friendly manner keeping in view the sustainability of the environment.

Q4 What is the environmental impact of your process? What measures does your business take to tackle waste management?

Since we are into recycling business and if not taken care properly then recycling of any metal or plastic has a huge impact on the environment. But we at Gravita are taking utmost care and investing in state-of-the-art technology in pollution control equipment so as to reduce the impact of recycling on the environment.

Q5 Does being a 'green business' add additional costs compared to regular businesses?

Yes, there are many incentives and government schemes which promote green business apart from this it also impacts the overall image of the business as people come to know that we are doing business with a noble cause.

Q6 Please explain the revenue model for your business.

The revenue of the company is a mix of both domestic and overseas market at present approximately 68% of the total revenue is generated from overseas market and around 32% is generated from the domestic market.

Q7 Is the current political environment in India conducive to the waste work you do?

Yes. The Government is cognizant of the fact that we must recycle waste responsibly. Already Niti Aayog is working on a draft material recycling policy, which will soon be ready for debate in the Parliament.

Q8 Are there policies in place that support or incentivize battery recycling?

Yes, up to certain extent policies are there.

Q9 What do you foresee as the greatest challenges for waste management and recycling for your business in India?

The informal sector has a very important role in India, and this must be integrated into formal systems. The informal sector is characterized by small-scale, labor-intensive, largely unregulated and unregistered low-technology manufacturing or provision of materials and services. Due to this unorganized sector, it is somewhat difficult to source the raw material for the business.

Q10 What do you think are the greatest opportunities?

As the people are becoming aware of the recycling day by day and various initiatives like Swachh Bharat Abhiyan run by Government of India we think that there is a vast opportunity in this business.

Q11 Do you think that 'green businesses' will become the norm in the future in India?

Today natural resources are vanishing, and people are realizing the benefits of recycling and everyone is concerned about the environment its cleanness and looking after most efficient ways to recycle the waste with minimum impact on the environment we think that Green business will become the norm in future in India.

Interview Analysis



The interviews provided a thorough understanding of the current state of commercial recycling and waste management in India. The businesses that were interviewed varied greatly in their years of operating, so it was interesting to see the similarities and contrasts in their responses. Some of the key themes identified during the interviews were as follows:

Q1 *Lack of policies to support green businesses.*

When asked if there were any policies to support their respective business, the responses varied from there being policies ‘up to a certain extent’ or none at all for rubber and e-waste. This further emphasizes that the current government has been overlooking waste management and recycling strategies to focus on other development issues.

Q2 *Value of running a green business.*

Across all responses, it was observed that being a compliant ‘green business’ does add extra costs for all operating firms. However, the extra costs are perceived as a small hurdle faced by the businesses, in light of the value that being “green” adds overall. Across the board, none of the companies have any intention to compromise on the environment focus in order to reduce costs, with Mr. Chatterjee stating that Tinna Rubber ‘would not operate any other way’.

Operating with an environmental focus also improves their brand image, and, according to the representative from Gravita, customers identify that the business is being conducted with a 'noble cause'. Overall, it has been established that being a green business definitely has more positives than negatives from both an environmental and commercial point of view.

Q3 *Recognizing the significance of the informal sector.*

Both Gravita and Karo Sambhav acknowledged the importance of the informal sector as a key step within their recycling processes. They also both mentioned the urgent need to formalize it.

For Gravita, the informal sector is responsible for the collection of their raw materials. However, they claim that the 'unorganized sector' makes it challenging for them to source raw materials for business.

Karo Sambhav relies on the informal sector for door-to-door e-waste collection and also characterize them as 'unorganized'. To improve this, they are taking personal measures to formalize the informal economy and are taking the initiative to 'build awareness about e-waste at the grass roots level. Lastly, Karo Sambhav is also attempting to increase the business's efficiency through 'building the capacity of the informal waste pickers who go door to door for waste collection'.

The reality that a group which has such a major role in India's recycling industry is unanimously perceived as 'unorganized' is a major point of concern. But, seeing that involved businesses are taking measures to improve the state of the informal sector in India is a big positive.

Q4 *Great potential for growth of the industry.*

Despite the current challenges faced by businesses in the recycling and waste management sector, there is a shared sense of optimism about what the future holds for this industry. There are also signs of technological advancement in the corporate recycling sector, with Gravita stating that 'state of the art technology' is used and Mr. Chatterjee from Tinna Rubber mentioning that their entire production process is 'completely mechanical'. All three businesses unanimously assert that awareness amongst the society is a major key to promote recycling and green businesses.

Resources & Important Links

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