



SUSTAINABLE FOOD PACKAGING SYSTEM IN RAILWAY SECTOR

Done By:

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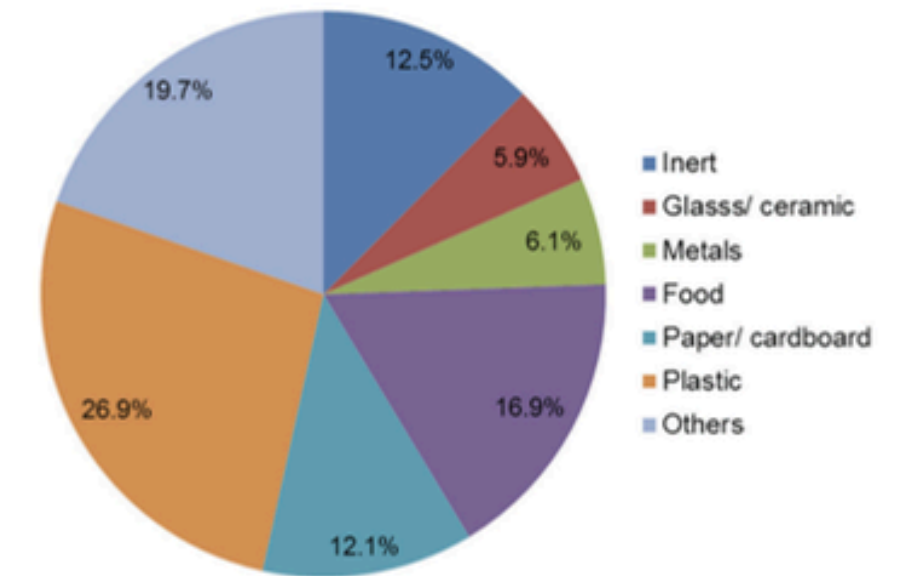
Gugulothu Sri Divya (2021MEB1369)

PROBLEM STATEMENT



DID YOU KNOW?

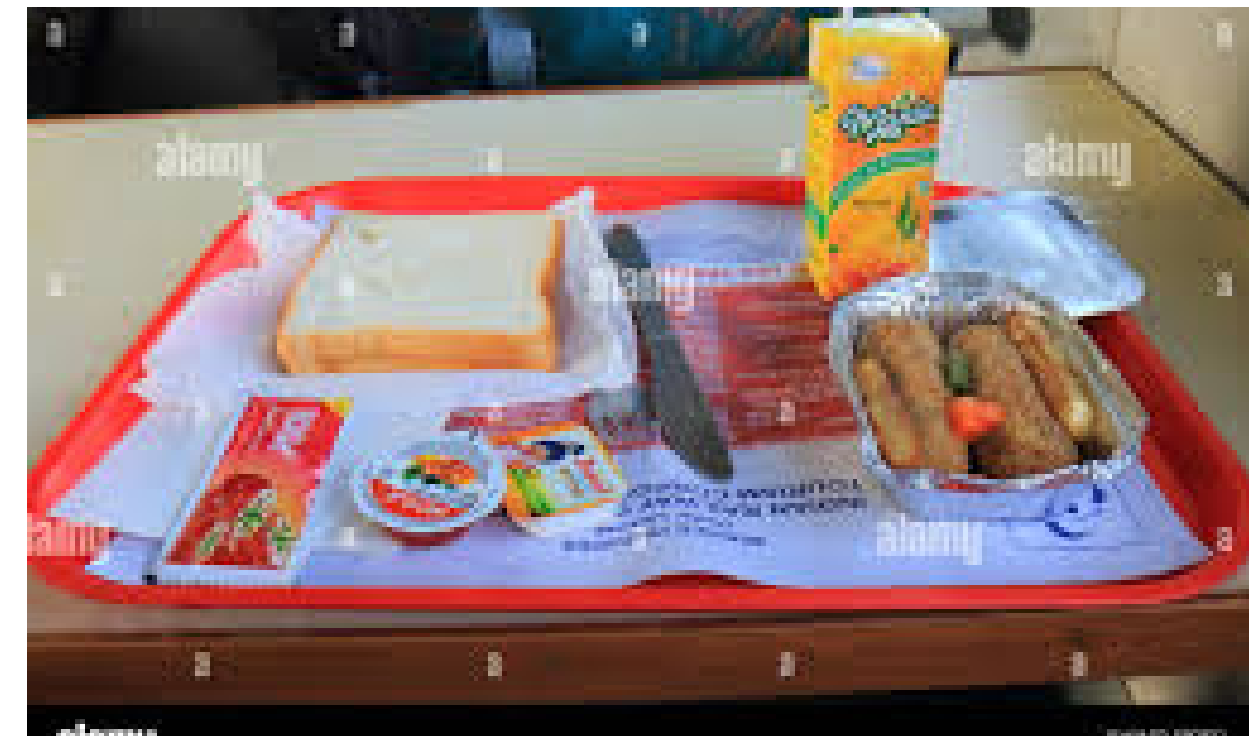
India's railway network serves over 23 million passengers daily, generating thousands of kilograms of packaging waste, most of which is non-biodegradable and ends up clogging tracks, drains, and nearby ecosystems.



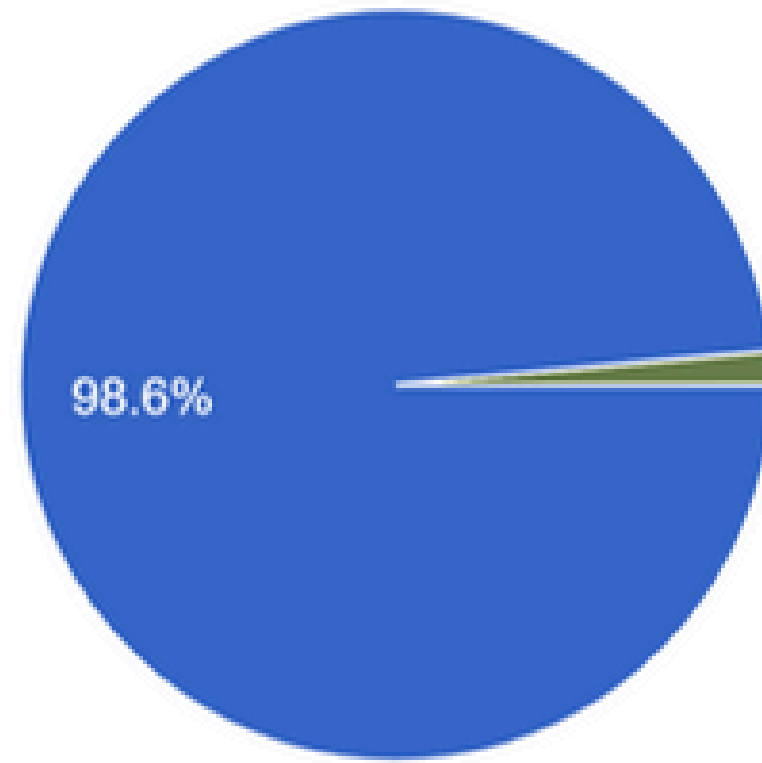
The current food packaging system in Indian Railways heavily relies on single-use plastics and non-biodegradable materials, leading to unmanageable waste, pollution, and health risks. There is an **urgent need for a sustainable, hygienic, and modular packaging solution** that aligns with eco-friendly practices and enhances passenger convenience.



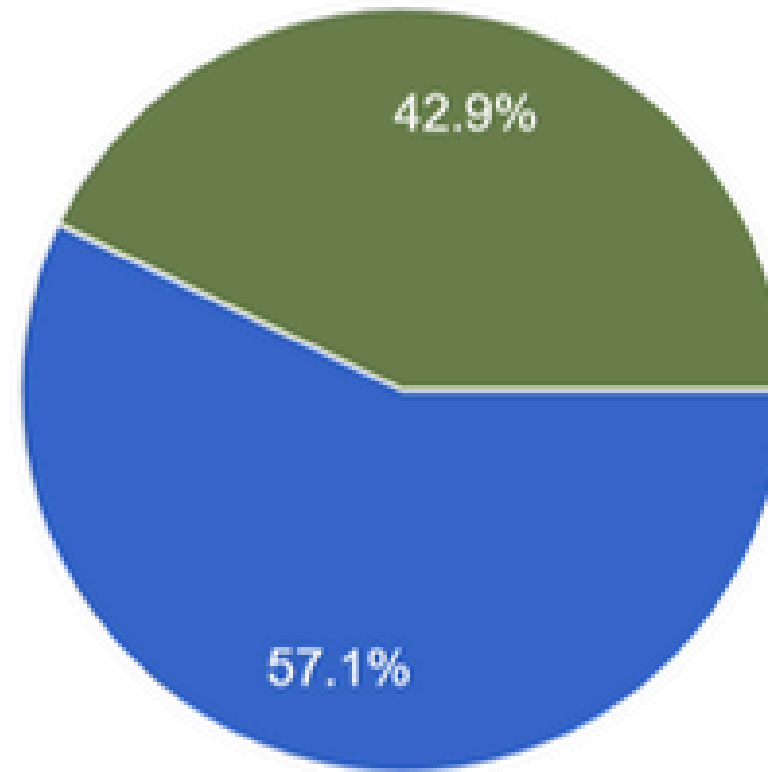
PRESENT FOOD PACKAGING AT RAILWAY



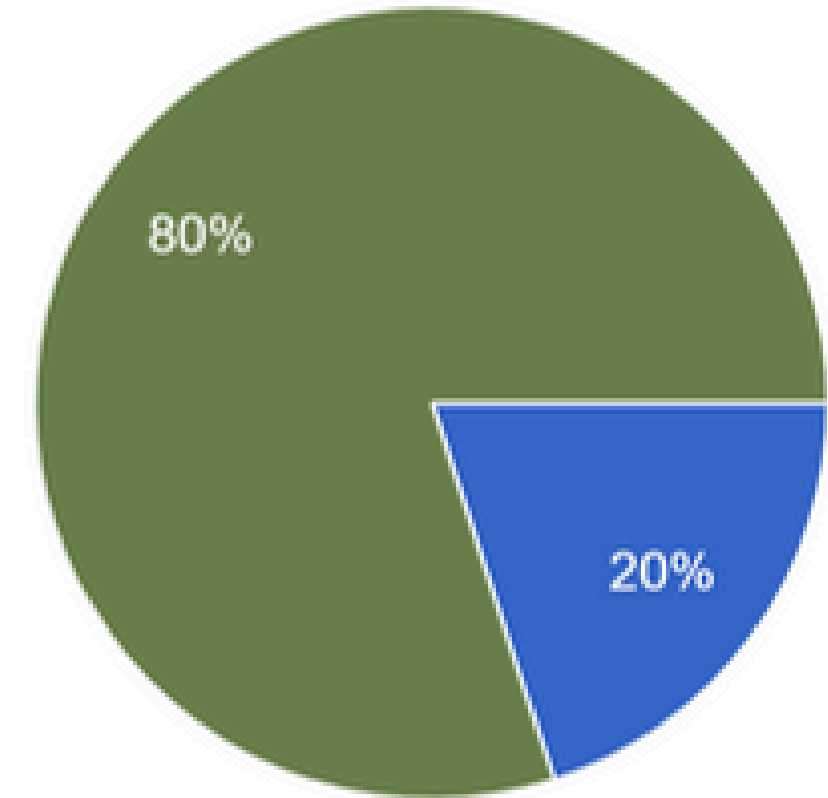
SURVEY



98.6% people
travelled by Indian
Railways



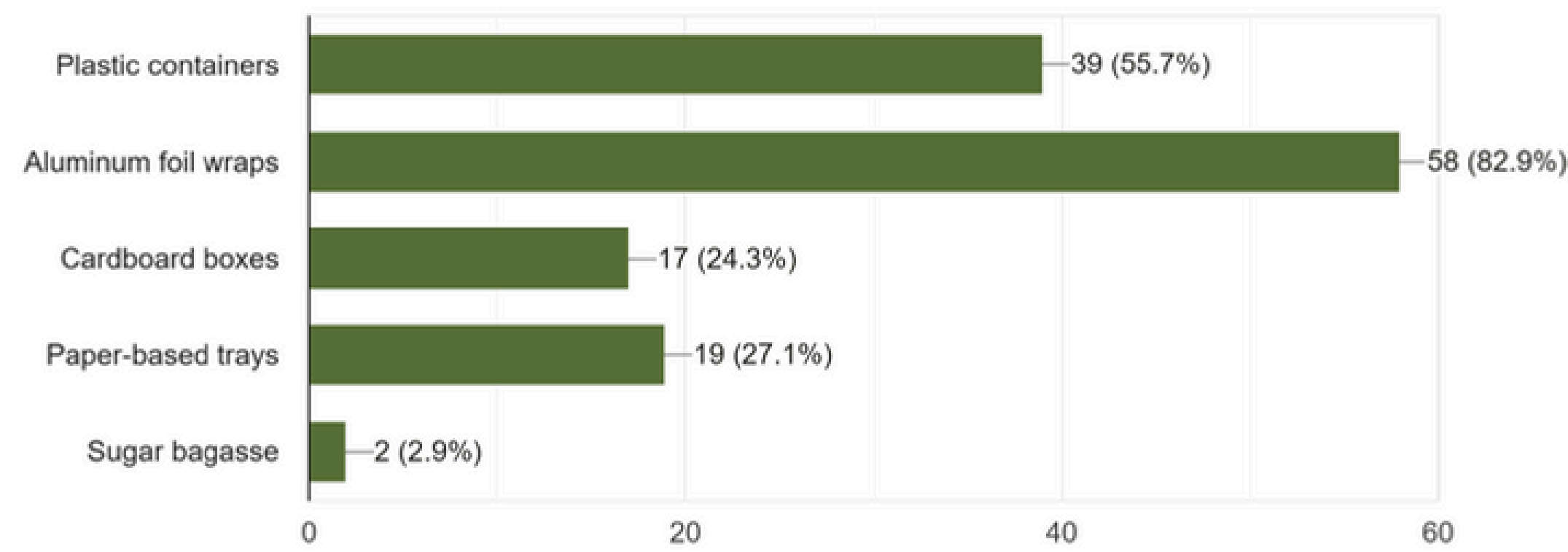
57.1% of people have
food provided by
the Indian Railways



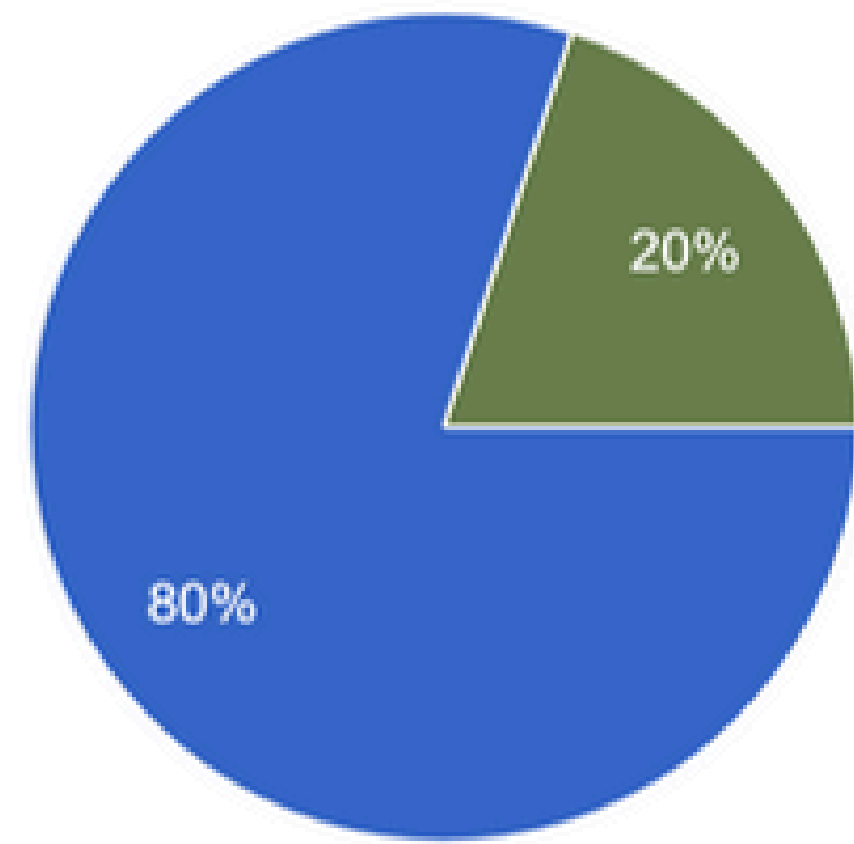
80% of people agree
that the packaging is
not sustainable



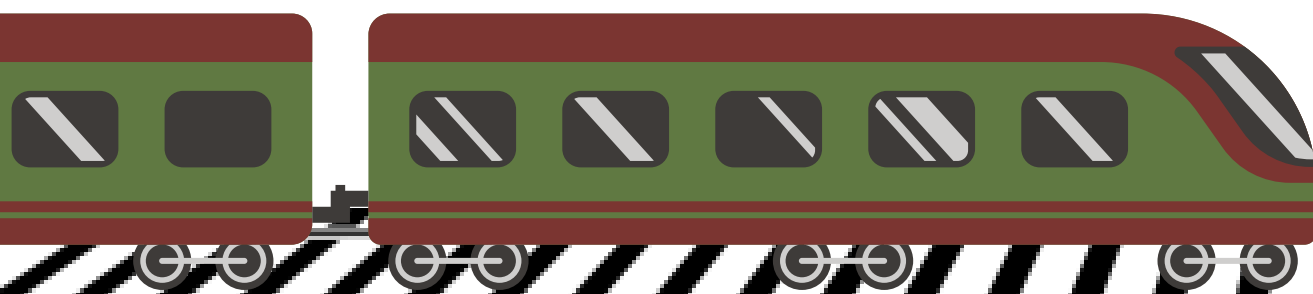
SURVEY



Types of packaging of containers that people have observed being provided in trains



When asked 80% of people said yes to pay 5-10 rupees more for sustainable packing.



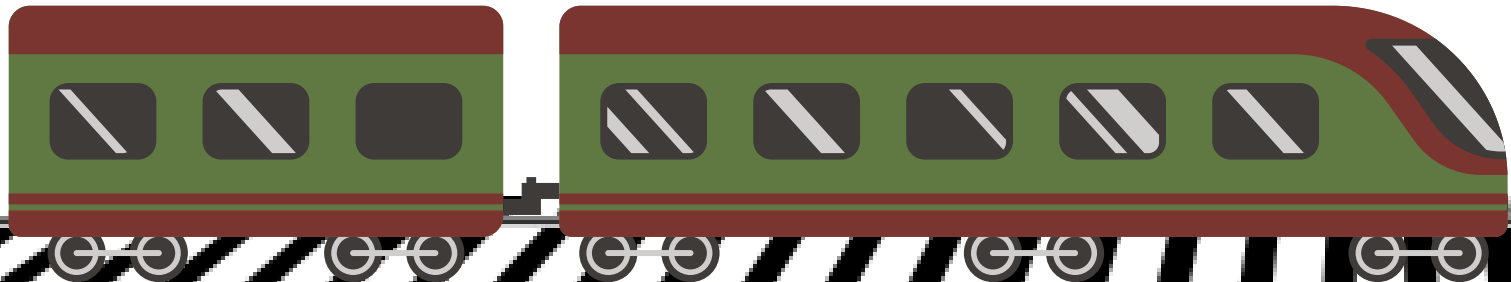
LIFE CYCLE ASSESSMENT



Typical Meal Tray Provided in
Trains - 1

Life Cycle Inventory (Inputs)

Component	Material	Weight (g)	Use Type
3 Foil Trays	Aluminium	15	Single - use
Roti Wrap	Aluminium Foil	3	Single - use
Curd Cup	Polystyrene	5	Single - use
Spoon	Biodegradable	4	Single - use
Tray	Plastic	250	Reuseable

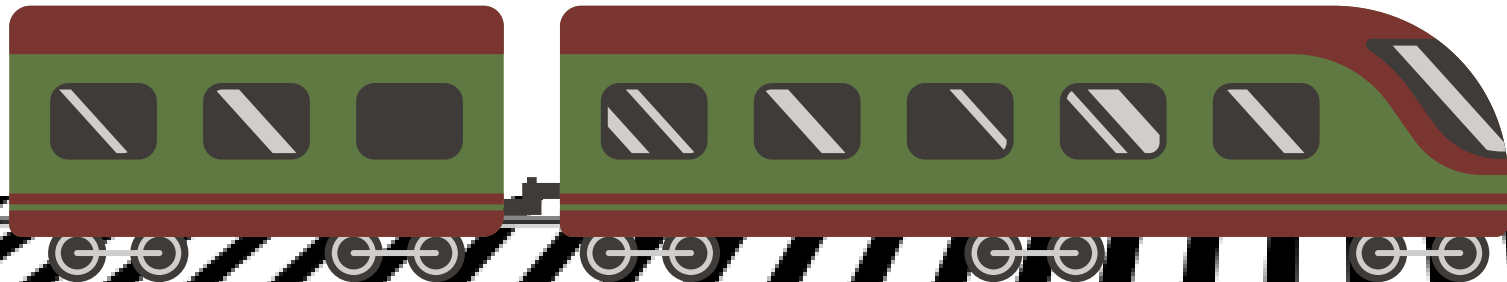


LIFE CYCLE IMPACT ASSESSMENT



Typical Meal Tray
Provided in Trains - 1

Impact Source	CO ₂ e Emissions (g)	Notes
Aluminium packaging	225	Energy-intensive to produce
PS curd cup	90	Poorly recyclable
PLA spoon	40	Lower emissions than plastic
Spoon	Biodegradable	4
Transport	80	Assumed diesel-powered delivery
Waste handling	100	Mixed treatment



Total Co2e emissions = 535 g

LIFE CYCLE ASSESSMENT



Typical Meal Tray Provided in
Trains - 2

Life Cycle Inventory (Inputs)

Component	Material	Weight (g)	Use Type
Tray	PET Plastic	30	Single - use
Spoon	Biodegradable	4	Single - use
Primary Packaging	None visible	—	Single - use

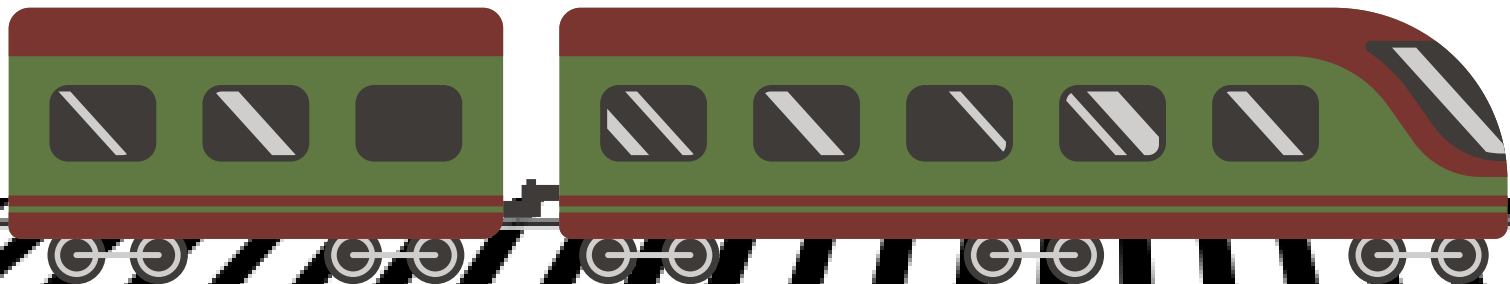


LIFE CYCLE IMPACT ASSESSMENT

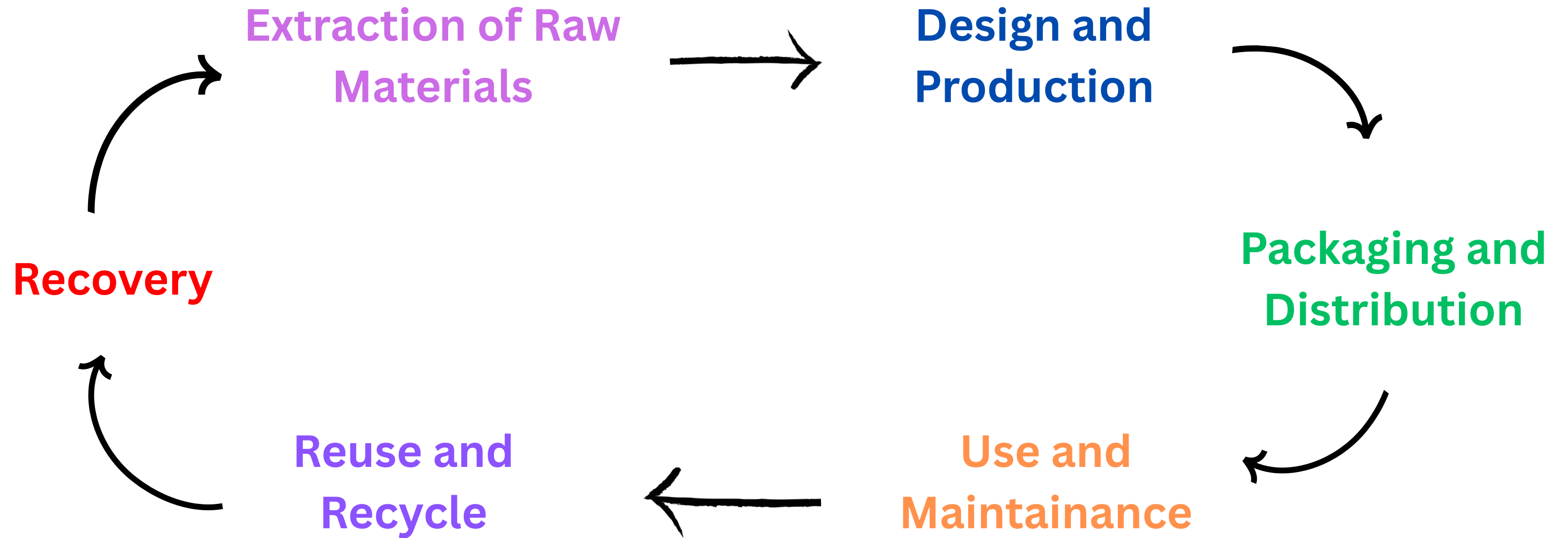


Typical Meal Tray
Provided in Trains - 2

Component	CO ₂ e Emissions (g)
PET Tray (30g)	170
Biodegradable Spoon	40
Transport (75 km)	80
Waste Handling	100
Total	390



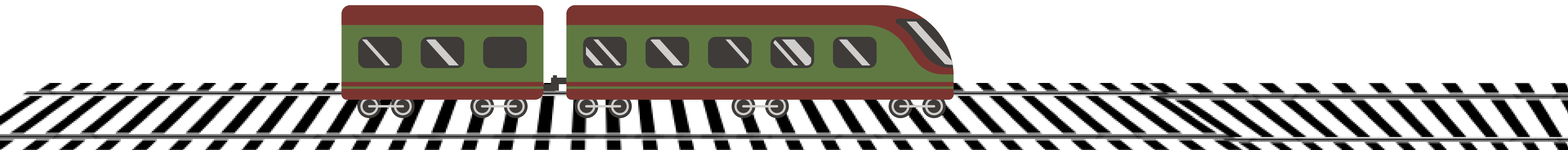
PRODUCT LIFECYCLE



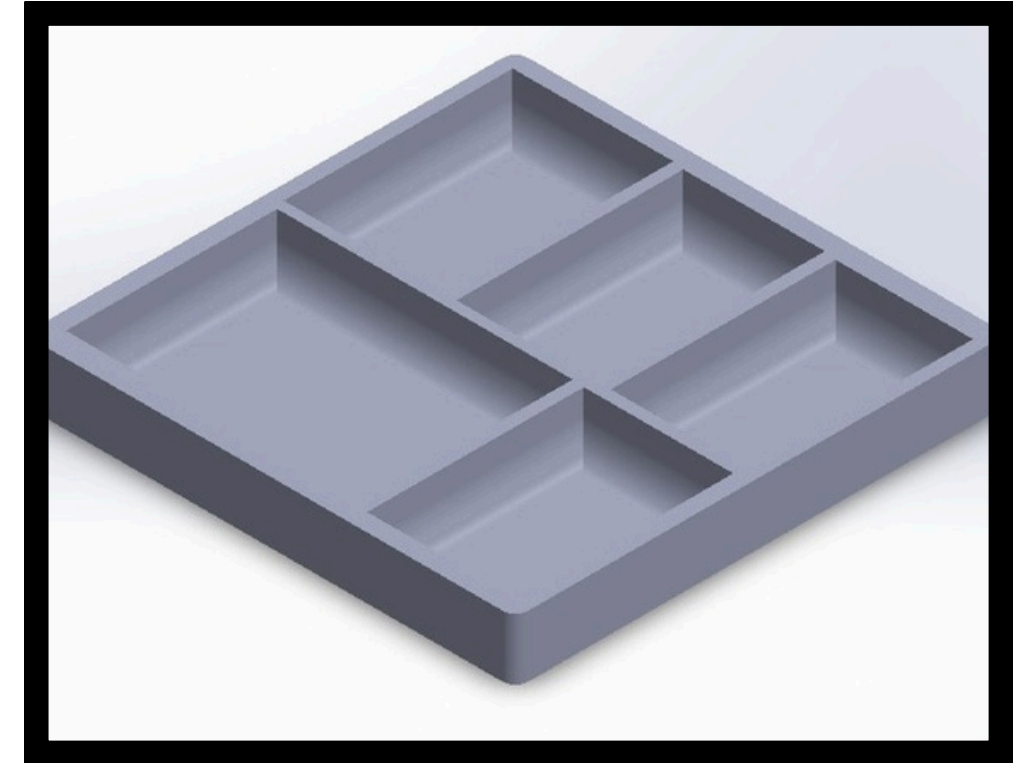
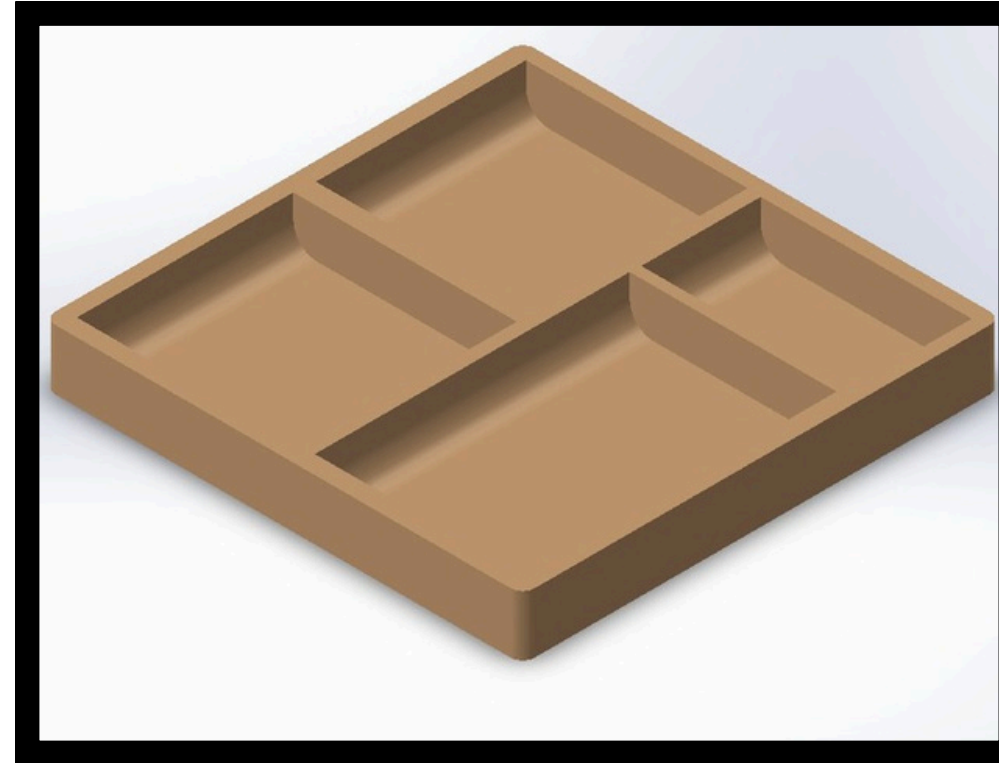
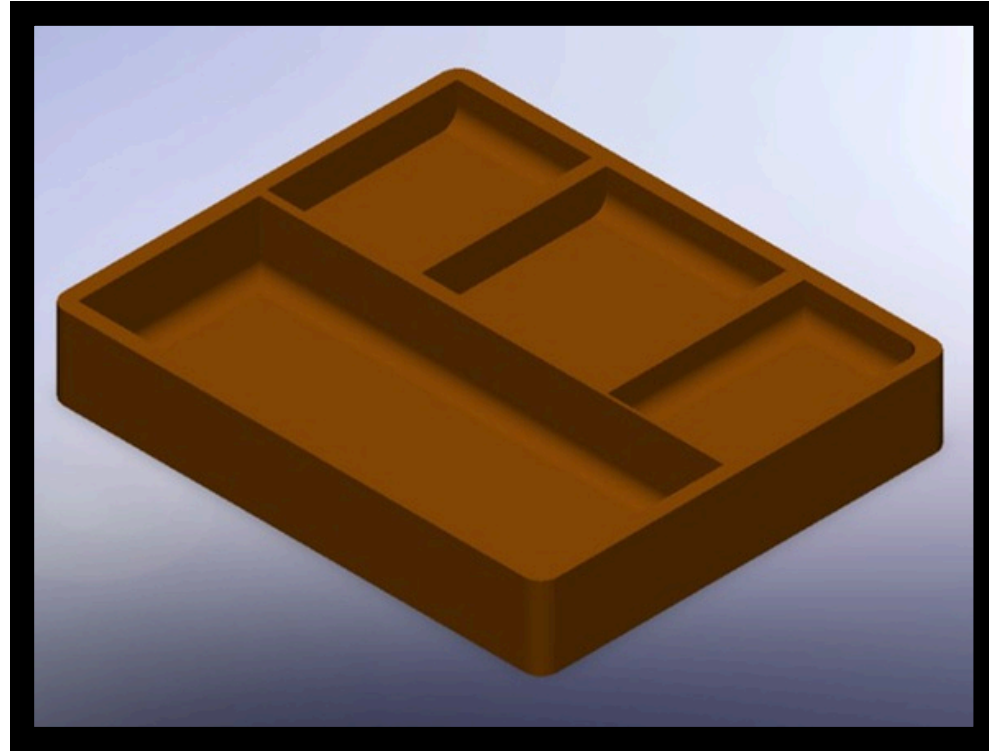
RAW MATERIALS

1. Recycled Cardboard - recyclable, strong
2. Banana and palm leaves- compostable and stiff
3. Sugar Bagasse - heat resistant, compostable
4. Mushroom mycelium - home compostable, customizable shapes

Considering materials advantages and disadvantages
Interchangeable base materials depending on region and purpose.



DESIGN



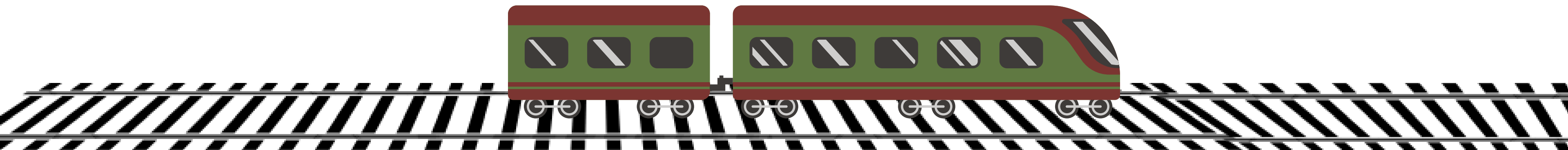
We have developed customized food packaging templates with adjustable compartments tailored to different food requirements by passengers



DESIGN



- The six-sided shape creates wider base support and even weight distribution, reducing the risk of the tray tipping.
- The angular edges also prevent rolling or sliding on flat surfaces like tray tables.
- It's like a honeycomb: compact, strong, and stable — a naturally efficient design.



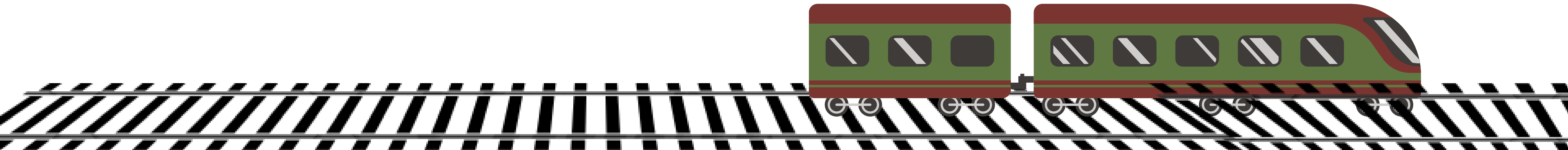
PRESENT POLICIES

Policy name	Focus Area	Enforced by	Impact on packaging
Swachh Rail Swachh Bharat	Cleanliness & waste segregation	Indian Railways/IRCTC	Encourages responsible disposal
IRCTC Vendor Guidelines	Contractual terms for food suppliers	IRCTC	Compliance-driven eco packaging
Green Railway Vision 2030	Net-zero emissions goal	Indian Railways	Sustainable logistics & materials



PRESENT POLICIES

Policy name	Focus Area	Enforced by	Impact on packaging
IRCTC sustainable procurement policy (2023)	Vendor sourcing and packaging standards	IRCTC	Mandates biodegradable packaging
Plastic waste management rules (2021)	National ban on single-use plastics < 50 microns, no plastic carry bags	MoEFCC	Outlaws common plastic items
Environment Management Policy	Environmental sustainability	IRCTC	Promotes green materials



SUGGESTED POLICIES

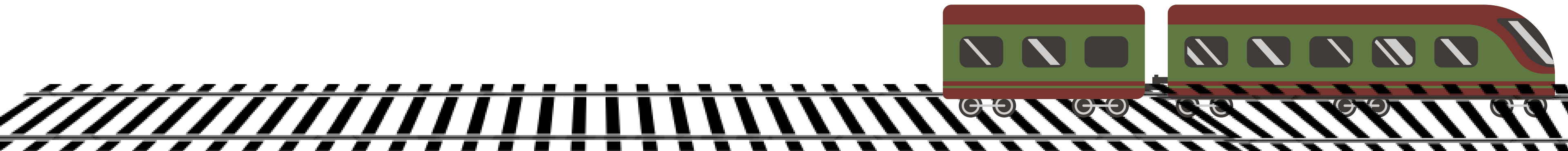
Biodegradable Packaging Mandate: Replace plastic with eco-friendly materials to reduce system-wide waste and enhance public perception.

Ban on Multi-Layered Packaging (MLPs): Use mono-materials for easier recycling and less landfill buildup.

Staff Training: Educate catering staff on sustainable packaging to ensure consistent and credible execution.

QR-Code Packaging Audit: Add QR codes for disposal guidance, material tracking, and vendor compliance—boosting transparency and consumer awareness.

Return-and-Reward System: Offer incentives for returning reusable containers, promoting a circular economy and reducing single-use packaging.





THANK YOU