



# INNOVATING INDIA'S <sup>1</sup><sup>st</sup>



**BIODEGRADABLE  
SPILL-PROOF  
MEAL TRAY**

## PROBLEM STATEMENT

In the last 5 years, the food delivery and catering services in India has exploded into a \$300 Mn market.

With food delivery, catering and food transport services racing against time to provide only the quickest services in the market, it essentially becomes important for these companies to focus on factors like spillage, temperature, deteriorated food quality like sogginess.

Usually, disposable containers with tightly closed lids are extremely difficult to find. Despite extensive usage of disposable containers, given how Indian meals have at least one curry based dish, the market is still rife with manufacturing issues coupled with lack of foresight. Adding to this, the recent plastic ban across Indian states has forced restaurants to look for alternate, more environment friendly solutions.

With the Karnataka plastic ban imposed in 2017, the Bizongo's Design team decided to take up an ambitious project that would help change the biodegradable landscape of India.

The biodegradable market in India is still in its nascent stages, and hence products like cutlery and plates are widely available compared to containers. But companies looking for spill-proof, meal trays which could hold well during transportation and manual handling were at a loss on the supply side.

The following case study will walk you through a detailed, end-to-end process of how this internationally acclaimed- **2018 Dieline Awards winner**- the spill-proof biodegradable 5-compartment meal tray was innovated for the mass-market.

## TESTIMONIAL



Working on this project with the Bizongo team was quite an experience. Building a product for a better environment that also helps fulfill market needs was definitely new. It is good to see that companies like Bizongo are pushing the boundaries by addressing market problems.

Even though we had worked with eco-friendly materials before, this project was definitely a challenge for us. Manufacturing of new products involves issues because you cannot address all the problems in the first try. During the development process, the team was quite responsive and were quite particular about the passing all the tests. There was clear communication and the team was quite professional and knowledgeable.

Working on this project was a great experience overall.

**- Jaskaran Singh Sahni**  
(Director, Partner Manufacturer)





## MARKET RESEARCH

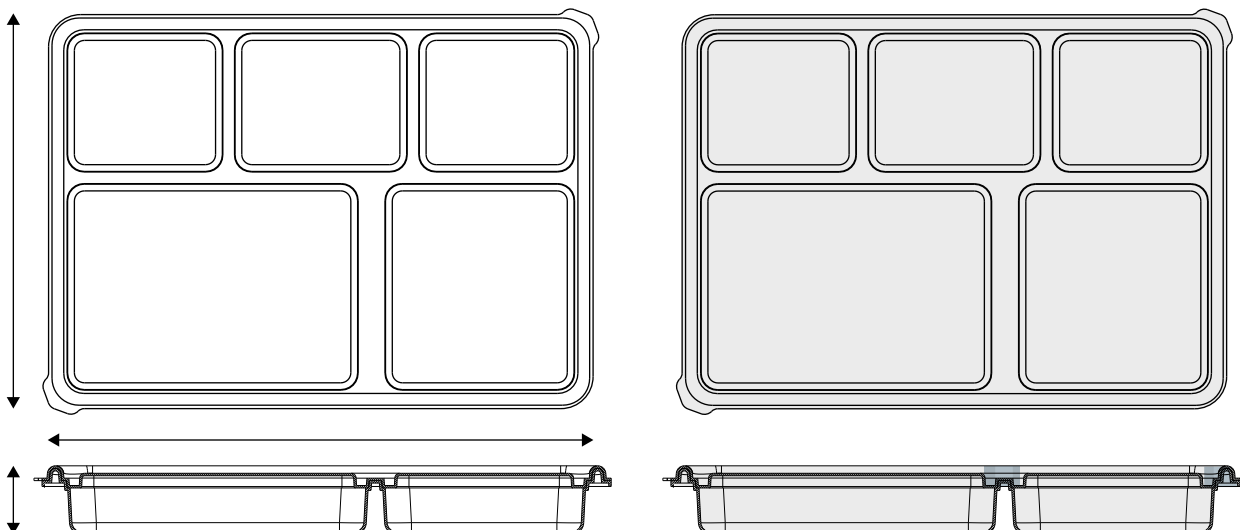
After connecting with hundreds of eco-friendly packaging product manufacturers, the team concluded there was a burning need in the market for an eco-friendly meal tray with a functional lid on top. The team studied issues faced by similar products like bowls with lids and one compartment meal trays and realised none of them had a penchant for the Indian cuisine.

Note: The tray is currently 70% biodegradable and our development team is experimenting towards making it 100% using alternate materials.



# DESIGN

Any Indian thali meal comprises of at least 4 to 5 dishes out of which 2 or 3 are gravy based. Hence, the meal tray design **focused on 5 compartments** with approximate volumes for each compartment as mentioned in the table below:



Food Item	Volume (in ml)
Rice/Roti	165
Dal	184
Sabzi	165
Salad	886
Raita	320

The spill-proof functionality of the tray was in fact inspired by a squarish bowl with a **highly functional grooving mechanism** which the team found after scouring through more than 50 different samples.

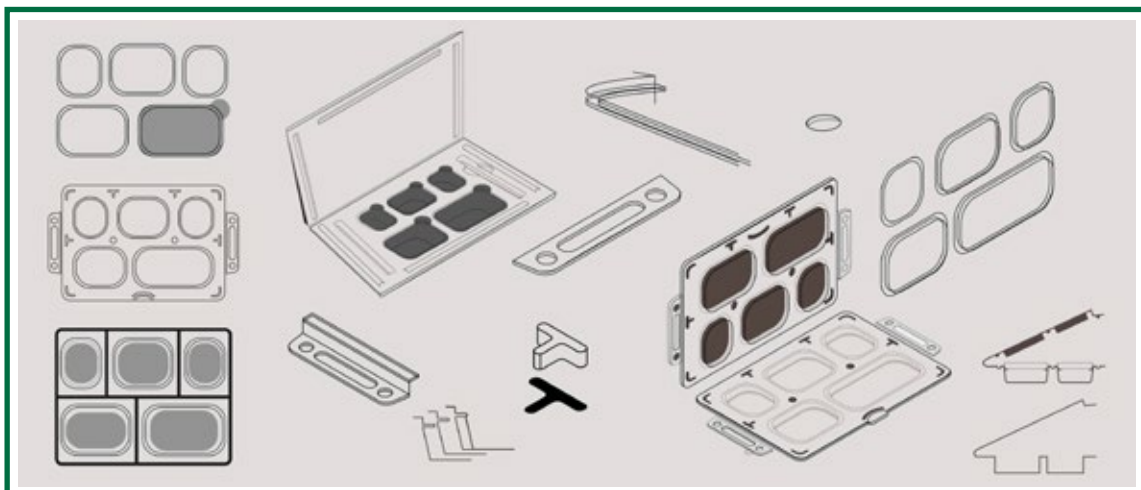
The actual locking mechanism of the tray was **specially engineered** to ensure that all the food items were contained within. Spillage does not occur just from the outer edges, but is also intra-compartmental. Indian meals are not just water-based foods like dal, but being higher in oil content, it is more prone to flow out easily. Hence, the mechanism had to be quite precise.

The grooves along the edge of the tray as well as between the compartments are designed such that they lock easily with little pressure. **The male-female mechanism of the base and the lid makes it a 100% spill proof.**



## DEVELOPMENT

During the development process, it was important to understand the kind of materials that were widely available and effective at the same time. Materials like bagasse, PLA, corn starch, bamboo amongst other biodegradable materials were explored.



We used a **cornstarch-PP composition** as it served our overall objective amazingly well. These trays possessed an appropriate degree of flexibility and strength while being biodegradable at the same time. Also, the amount of PP accumulated in the landfills would drastically reduce.

Currently, the team is experimenting ways to eliminate PP completely or use a substitute that would be eco-friendly while preserving the same functional features.

After exploring various manufacturing processes, **thermoforming was the preferred choice**, taking into account the cost effectiveness and feasibility. Additionally, our design concepts in terms of the mechanism were easier to adapt to the thermoforming moulding process.





# PROCUREMENT

This was one of the most difficult processes we had to go through, i.e., searching for a partner manufacturer who:

- Has previously worked with such materials
- Has the capacity to undergo prototyping and iterations at an exhaustive level
- Can mass produce and has good market knowledge
- Is trustworthy

The partner manufacturers we finally chose were the only unit in India who met all of the above criteria. Needless to say, due to lack of awareness amongst the manufacturers, our teams took a while to find them.

Once the product was built, it had to undergo various tests like **Biodegradability, pH, carbon content, migration test**, and more to ensure it was market ready. **The Testing certificate declares that the meal tray is a 100% spill-proof, safe for food and is 100% eco-friendly.**

## LOOKING AHEAD

With the recent plastic ban in Maharashtra, the Indian government is taking bold steps to reduce the overall plastic output. India is still hugely dependent on the decentralised rag picking community and recycling centres. But how much ever this move is appreciated, from the supply end the market still needs to undergo a massive change to cater to the ever increasing demands.

This meal tray is one of Bizongo's many initiatives to introduce and promote sustainability in the packaging ecosystem.

Note: For further enquiries about the above meal tray or about other design related products, kindly drop in a mail to [design@bizongo.com](mailto:design@bizongo.com)

# Thank You

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