

Kisan Quest Design competition

SMART PACK



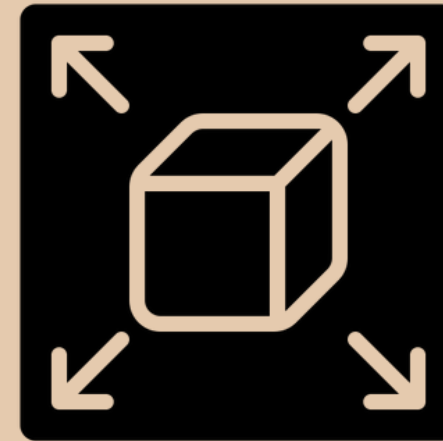
DESIGN BRIEF



Shelf-Life
Extension



Eco-friendly Materials



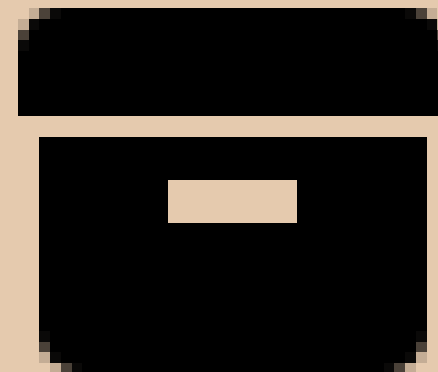
Modular &
Scalable



Budget & Cost
Guidelines



Target Users



Design &
Usability



Rural Friendly
Design

INTENDED TYPE: Bulky Fruits



PROBLEM: Bulky fruits are **highly perishable, fragile, economically valuable, and face major post-harvest losses.**

RESEARCH SUBJECT USED: Banana, Papaya, Watermelon



MATERIAL STUDY: Enhance Shelf life



Aloe Vera Gel Coating -

- Forms thin edible layer, slows respiration, prevents moisture loss.
- Adds 5–7 days to shelf life of bananas.



Clay/Zeolite Sachets (Ethylene Absorbers) -

- Absorb ethylene gas released by bananas.
- Extends shelf life by 7–14 days.



Essential Oil Sprays (Neem, Cinnamon) -

- Natural antifungal and antibacterial properties.
- Used in very small amounts as surface treatment.

NATURAL RESOURCES FOR PACKAGING



Areca Palm Sheath
Boxes/Trays -
Biodegradable, water-
resistant



Terracotta Inserts -
Cooling discs or base
plates to regulate
temperature.

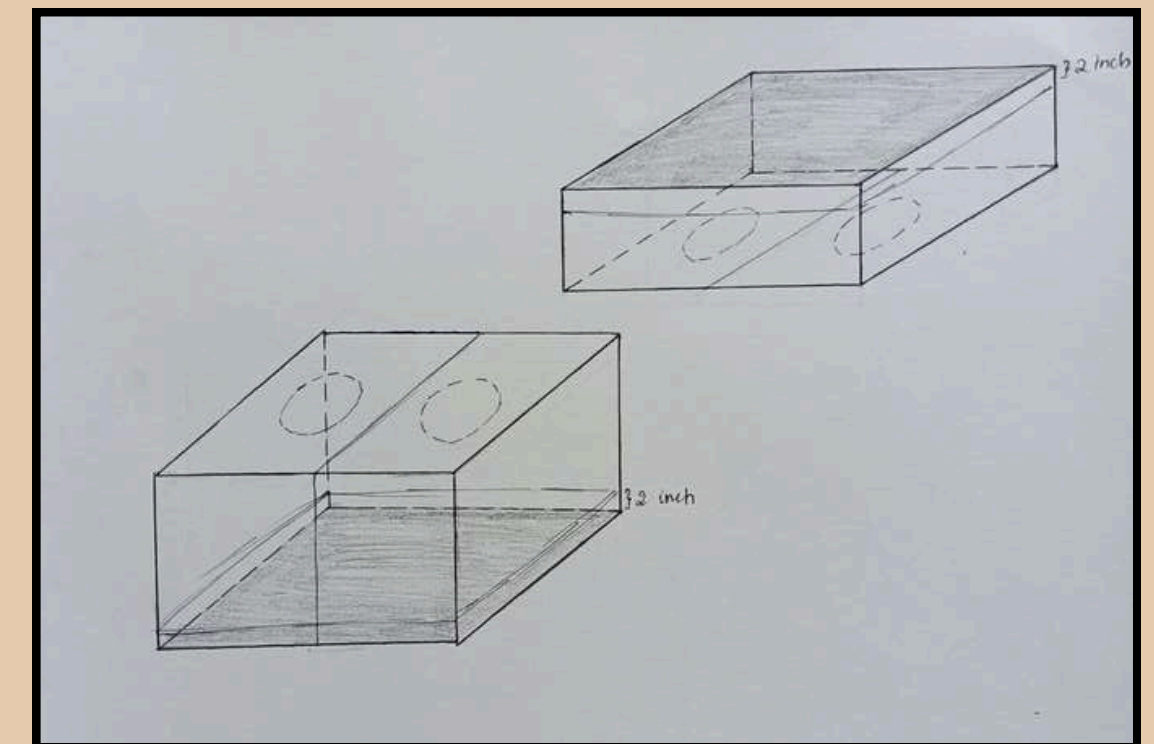
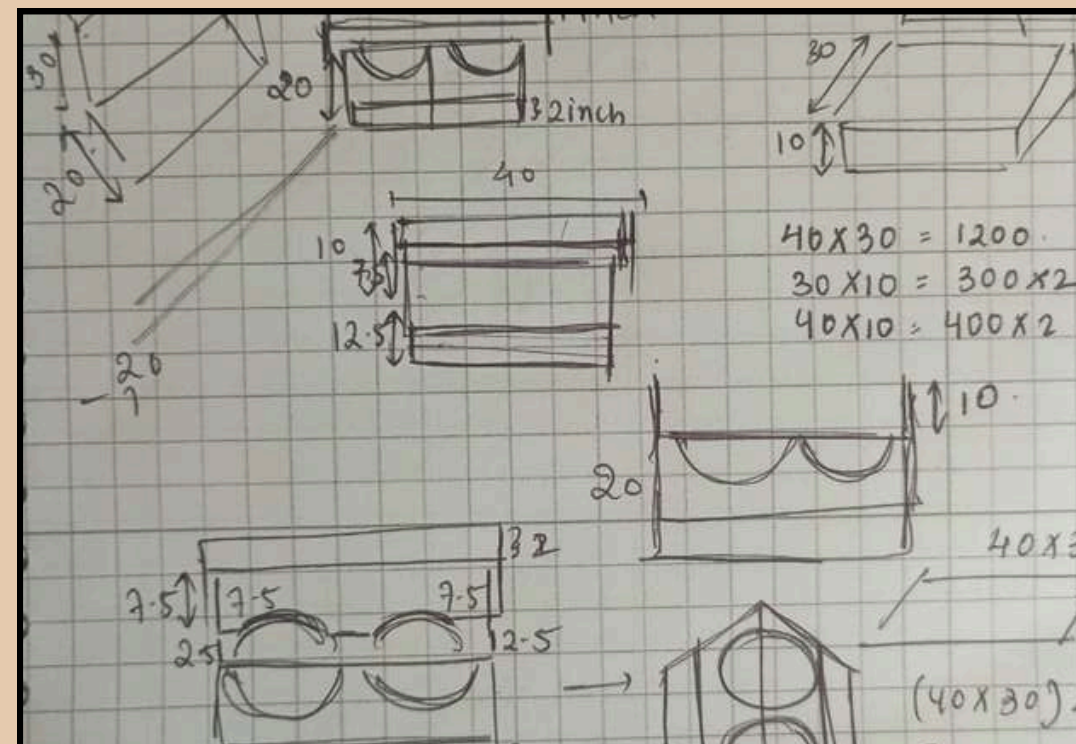
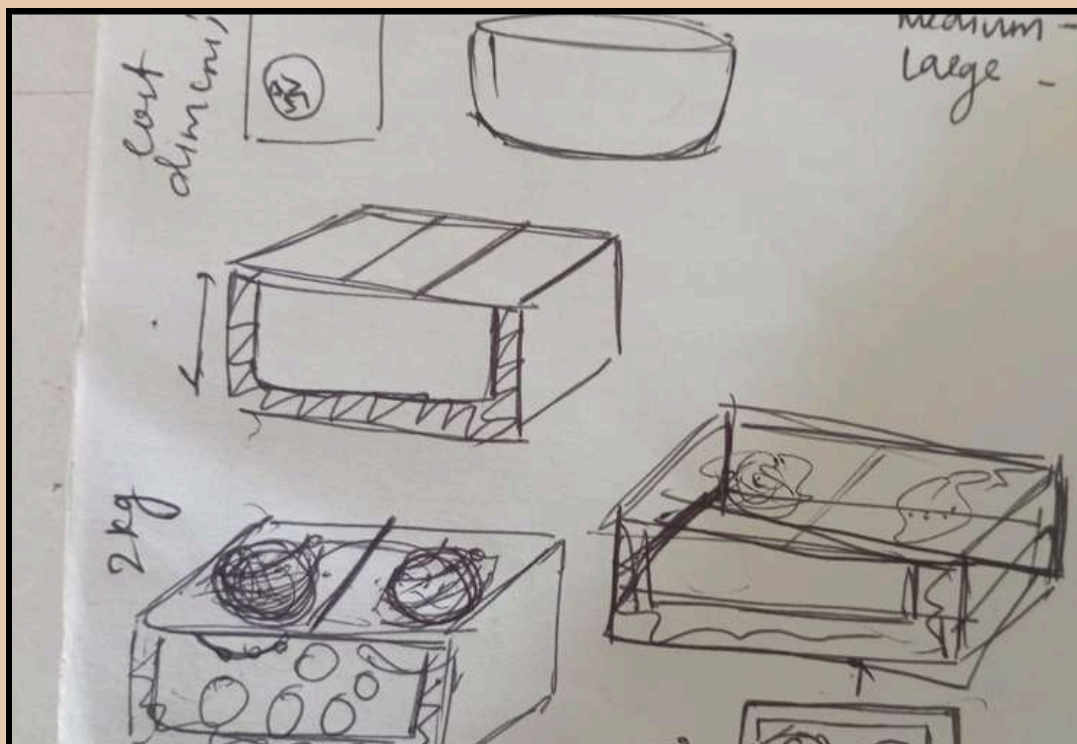
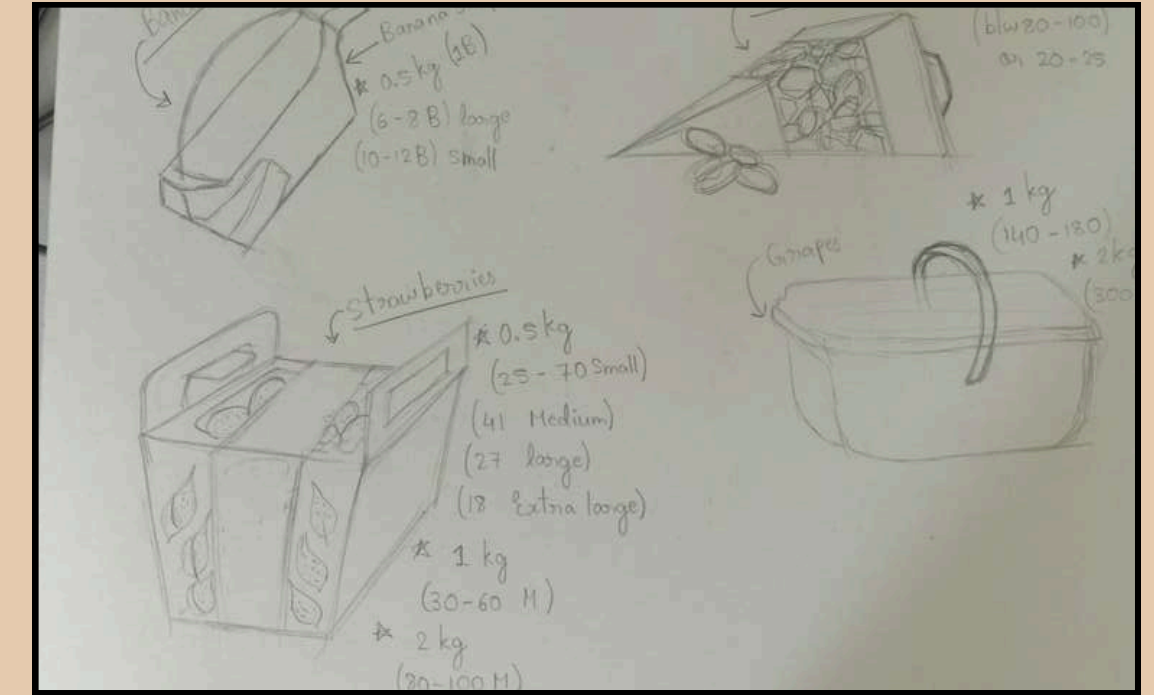
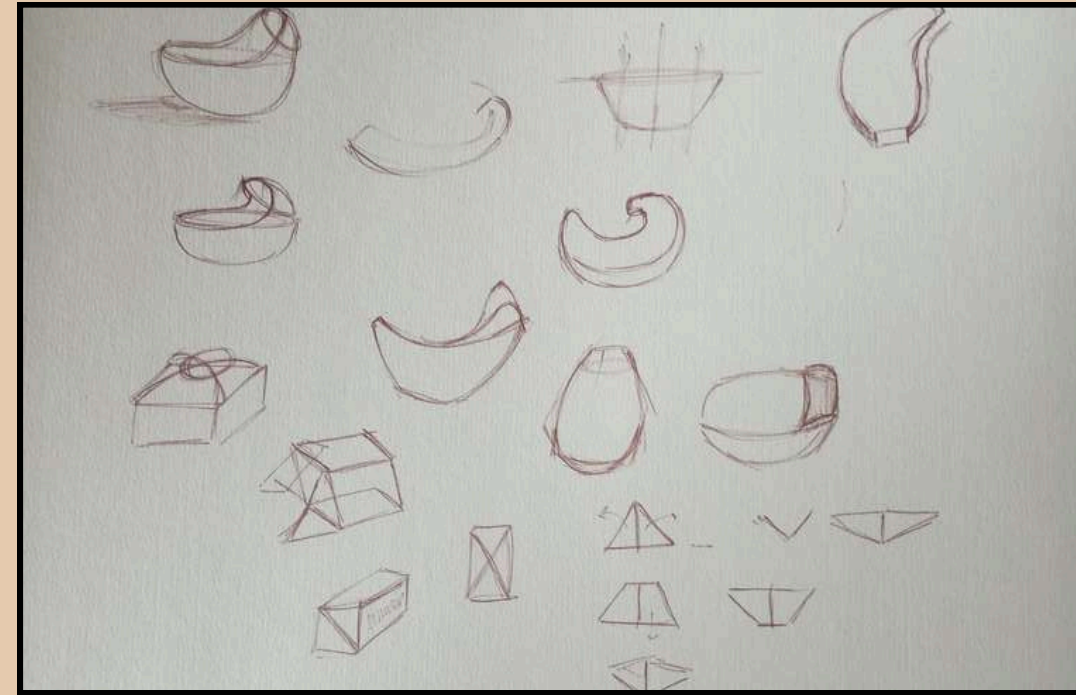
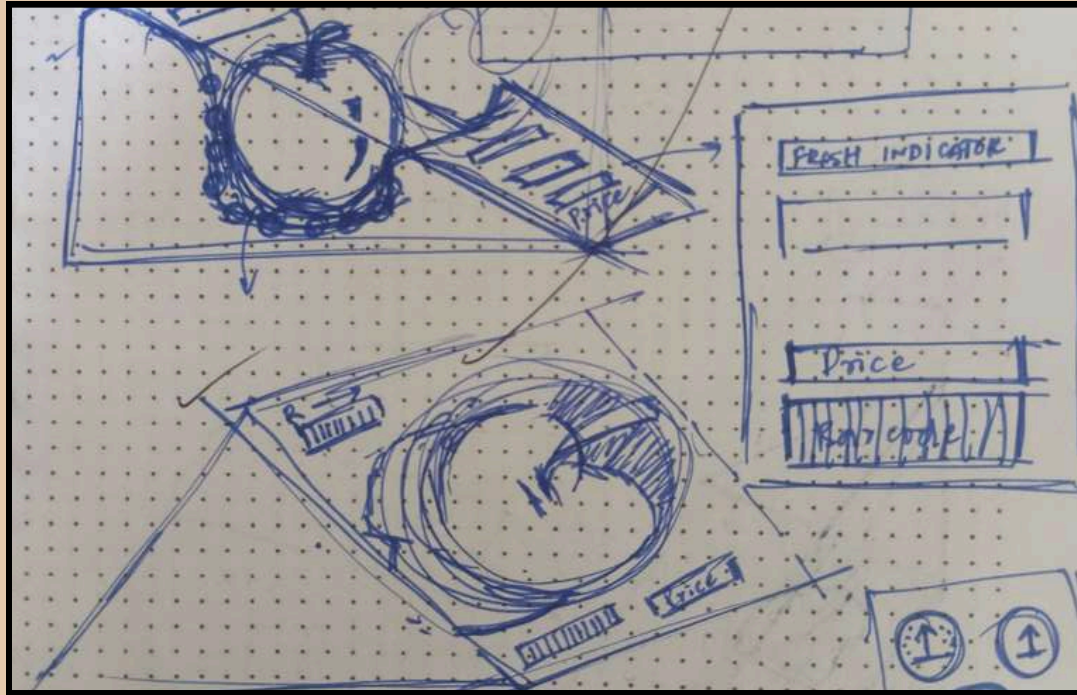


Banana Leaves -
Natural liners inside
crates, compostable,
easily available at farms.



Coconut Husk or Coir
Shell Boxes -
Shock-absorbing,
moisture-resistant.

IDEATION: Exploring packaging



BOX: A crucial material

- Low weight and easy to handle.
- The relatively soft walls have a cushioning effect.
- The boxes are excellent for stacking due to their inherent structural strength.
- The boxes are delivered flat and assembling boxes can be done locally.
- The box has a low purchase cost.
- The material can be printed to give the box a pleasant and recognizable appearance. Also the label can be included in this print.



PACKAGE DESIGN

Size: 40x30x30 cm/ 15x11x11 in

- Corrugated Box provides rigidity, stack ability, and protection during transport.
- Tessellated structure helps hold fruits firmly in place.
- Coconut coir acts as a natural shock absorber, reducing damage and bruising of delicate fruits like bananas.
- Compartments prevents fruits from rubbing against each other, reducing spoilage.
- Packaging keeps fruits fresh and intact during long-distance transport from farms to mandis, retailers, or export markets.
- Can directly be placed in retail shelves as a ready-to-sell box without repackaging.
- Useful for fruit delivery services, online grocery platforms.
- Aligns with sustainable, biodegradable, and zero-plastic initiatives in packaging.





FARM PRODUCE GETTING PACKED



PACKAGES COLLECTED FROM FARM



PACKAGES DELIVERING IN HARSH CONDITIONS

1.



PACKAGE DELIVERED TO CUSTOMER

2.



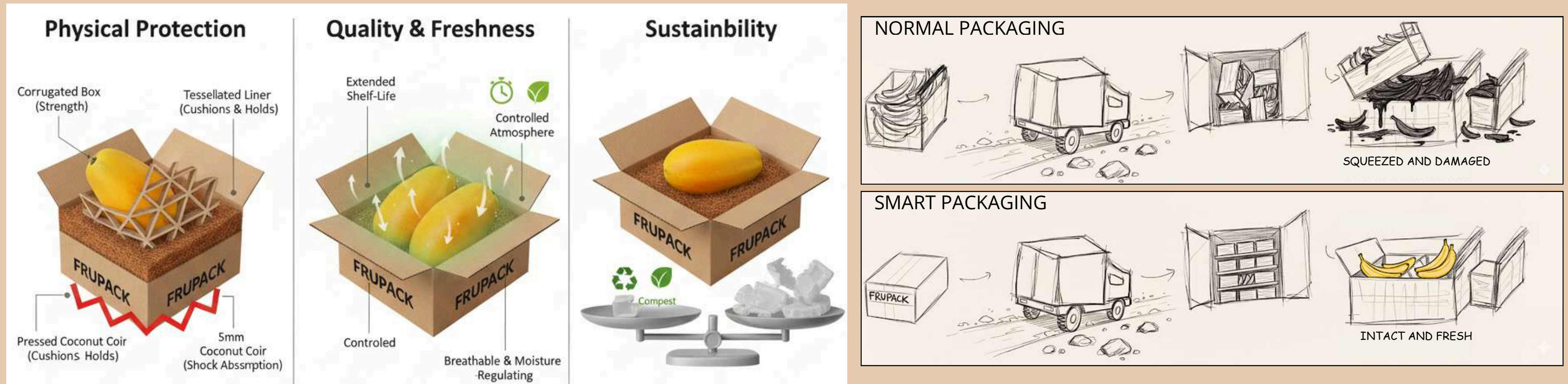
PACKAGES DELIVERED TO MANDI

3.



PACKAGES DELIVERED TO RETAIL SUPPLIES

IMPACT



- Physical Protection: A multi-layered system **absorbs shocks, preventing bruising and squeezing during transport.**
- Quality & Freshness: The natural materials allow for **controlled airflow, which slows ripening and keeps the fruit fresh for longer.**
- Sustainability: All components are **natural, biodegradable, or recyclable**, offering an eco-friendly alternative to plastic.