

# APPROPRIATE FOOD PACKAGING SOLUTIONS FOR DEVELOPING COUNTRIES

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Amidst The  
Challenge Of

Global  
Food Loss

&

Potentials

Of the  
Agrifood  
System



## The Global Packaging Industry

- Size
- Structure
- products

## Overview of The Packaging Industry in Developing Countries

- Status
- Trends
- SWOT Analysis

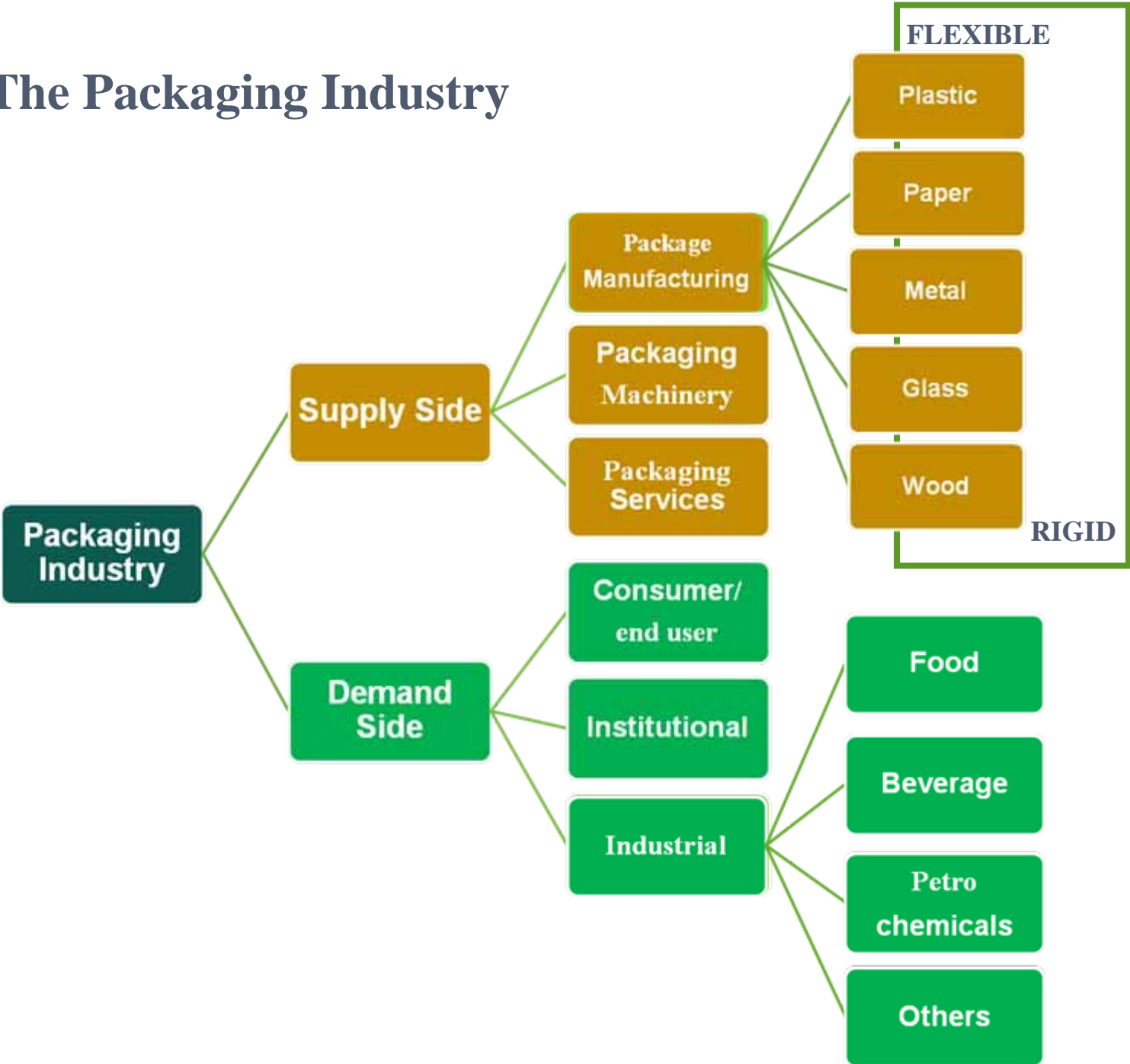
## Appropriate Packaging Solutions in Developing Countries

- Addressing  
Constraints
- Meeting Packaging  
Needs

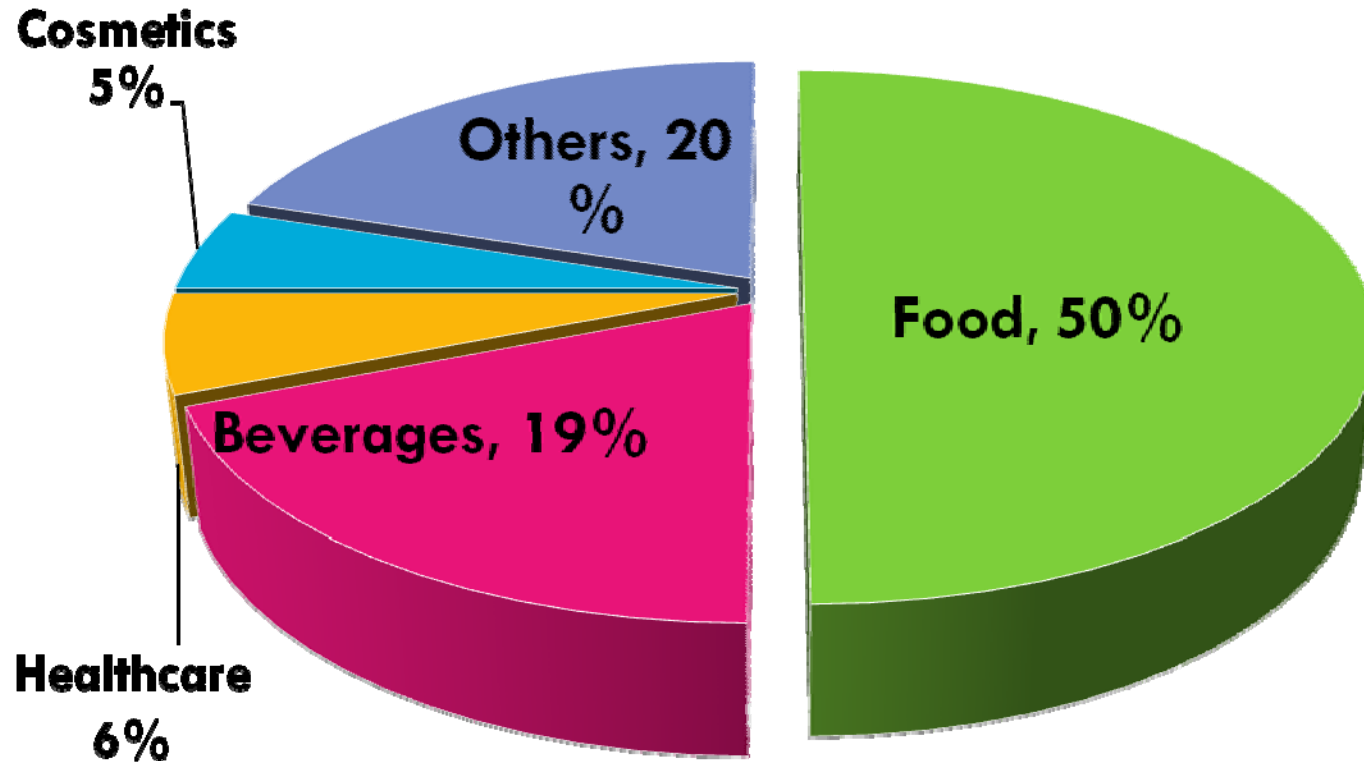
# Appropriate Food Packaging Solutions For Developing Countries

Within the limits of prevailing levels of Development in  
the Developing countries

# The Packaging Industry

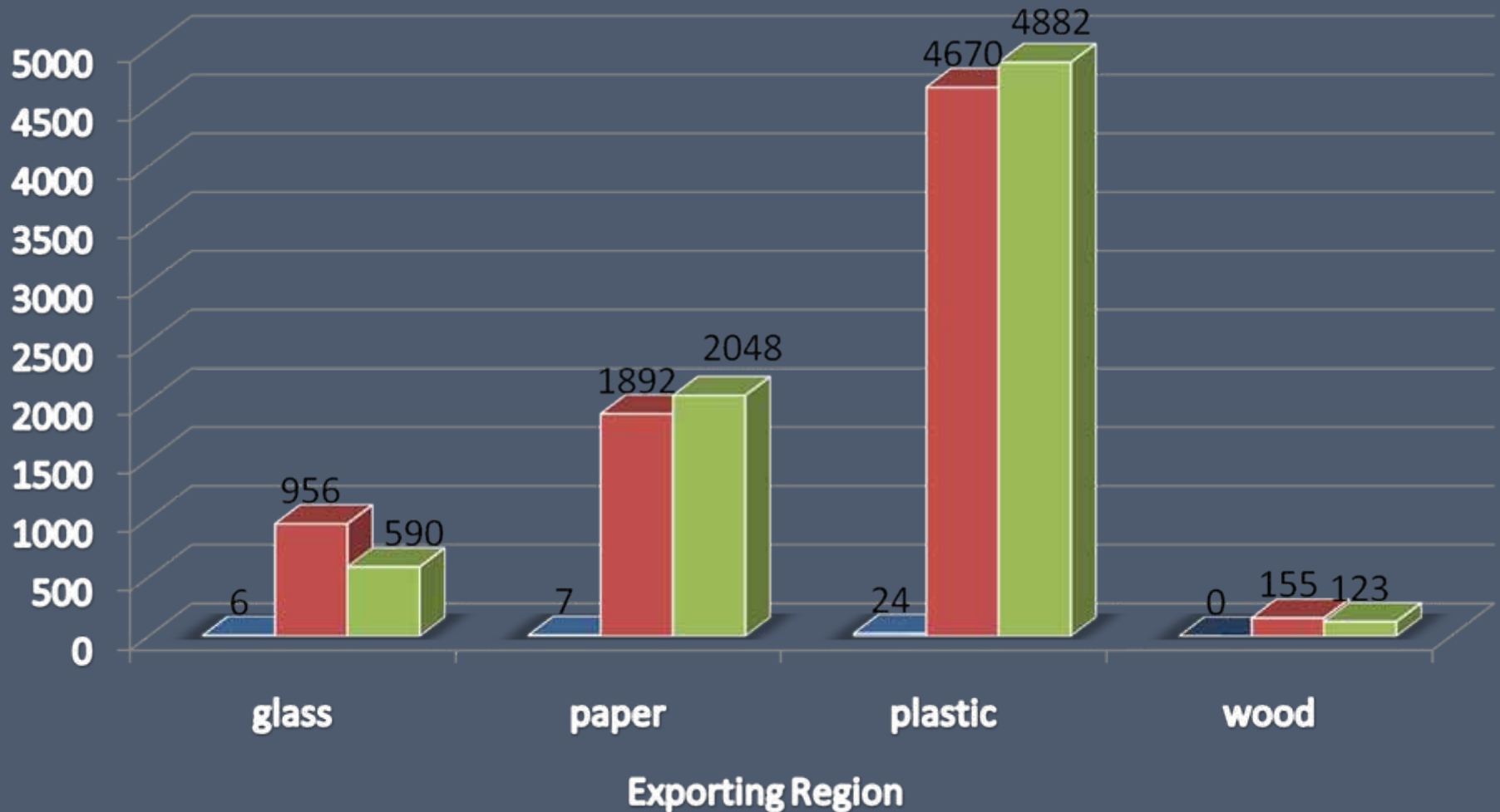


# The Global Consumer Packaging Industry by end use, 2009



**US \$ 380 Billion**

Figure 1. Average Import of packaging materials of developing market economies, 2005 – 2009 (million US dollars)



■ least developed countries

■ developing market economies

■ developed market economies

# Selected SWOT Industry Analysis

## Strengths

- strong food processing industry (for all)
- improving economic growth, rising middle class, increasing consumption(Asia, LA, MENA)
- Geographic advantages  
Proximity & favorable access within & beyond the wider middle east (SSA, MENA)

## Opportunities

- Changing Consumer Preferences  
increasing demand for processed & packaged foods  
increasing health & brand consciousness
- Increasing Domestic market offering  
(investment opportunities)

## Weaknesses

- Poor infrastructure
- Limited Facilities & raw materials
- Underdeveloped agricultural Sector

## Weak economic Growth

## Threats

- Political issues  
perceived bureaucracy & corruption
- Globalization/open economy  
SMEs unable to cope with competition
- Increasing raw material costs
- Climate change  
jeopardizes many food processing industries

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# Selected Issues & Responses to Packaging Challenges In Developing countries

- R&D Institution Generated Packaging Technology
- Use of Indigenous Material for Packaging
- Cost Effective SME Packaging Innovations For Enhanced Competitiveness
- Packing and Packaging Facility at Ports
- Packaging As a Positioning Strategy
- Packaging Innovations

# R&D Institution Generated Storage Packaging Technology : Challenges & Issues

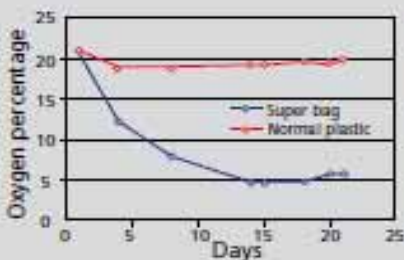
- Training Component is Critical
  - Simple technology but wrong usage renders it non functional ( improper sealing, over filling, etc)
  - Quality aspect is important and facilitating understanding of quality needs to be part of the training
  - Include teaching the principle(Example: teach to use the Super bag (the product) and the principle of hermetic storage in existing containers
- Needs an enabled environment
  - While technology is available, issues such as IPR, tax and tax exemptions delimit use of technology
  - Conflicting perspective at the national and field level; government claims farmers not storing seeds but they do
- Takes time for benefits to sink in (the adoption that takes time more than the R & D)
  - takes time for the benefits to become visible to users (longer time to store compare to traditional system);
  - business models needed for usage and for distribution of technology

**What it is**  
 The International Rice Research Institute (IRRI) bag is a farmer friendly 50kg storage bag that allows cereal grains to be safely stored for extended period. The super bag fits as a liner inside existing woven jute or polypropylene storage bags presently used by farmers. The bags are made from a tough transparent multi layer polyethylene material which incorporates a gas barrier that restricts oxygen and water vapor movement.

**How does it work?**  
 Sealing the grain inside the super bag stops the uptake of moisture and oxygen from the surrounding air and protects the grain from pests and disease. Respiration by the grain and the insects trapped inside the storage system quickly reduce the inter- granular oxygen levels from 21% to less than 5%. Studies have shown

- life of seed extended from 6 to 12 months
- Head rice yields improved by 10 percent
- Insect numbers are reduced to less than 1insect/kg of grain with out using insecticides and often within 10 days of sealing

**Contributor: Martin Gummert, Senior Scientist  
 Post Harvest Development, IRRI**



SuperBags can be stored as any other storage bag

# Packaging Solutions: Use of Indigenous Material

## Indigenous Packaging Made Waves & Facilitated Sustained Presence in Egypt Market

### **The Situation:**

#### Industry Level

Competition in the global olive oil consumer market is very fierce and is monopolized by traditional producing countries like Italy and Spain, and there is very little room for newcomers, unless in bulk, where the oil would be bottled under unknown brands of traditional producers.

#### Country Level

Egypt emerged as an olive exporting country only in the mid-nineties and the tiny export quantities were mostly in bulk. As such, the country lacked image and branding which negatively affected producers who wanted to export added value olive oil in consumer packages.

### **The Packaging Strategy:**

#### Objective

To add uniqueness to the product through packaging which would attract consumers, an Egyptian olive oil producer innovated a premium package with well executed details for export markets. The package: consisted of a wooden box made out of recycled light wooden boards covered with papyrus which is thick paper-like material produced from the pith of the papyrus plant, *Cyperus papyrus*. The papyrus is hand-painted with scenes of Egyptian old civilization.

#### The outcome:

Thanks to this innovative packaging style, consumers in export markets were attracted to buy from a new non-traditional producer with little track record in the market. Note that the painting on the packaging bears no relation to olive oil what so ever. The package, which is entirely hand-made, also helped sustain the livelihood of craftsmen and women and young artists.

*(Information source: Mohamed el-Kholy, Farmer and Olive Oil Producer, Egypt)*



# Enhancing Competitiveness of SMEs

## Box 2. Cost-effective packaging innovation

1. Plastic crates  
(versus woven baskets)



2. Collapsible metal crates



Domestic market

3. Display ready boxes

Export market



### Innovative packaging

- **Plastic crates**

Allow fruits to withstand rough roads when transported from farm to packaging sites, reusable a number of times.

- **Collapsible metal crates**

Reduces damage during transport, have done away with 10-15% losses of conventional packaging. Save on space when transported back empty after delivery; however, to recover the cost the metal crates have to be used at least 80 times.

- **Display ready boxes**

Have reduced handling losses on terms of bruises by minimizing points of contact when transferring fruits from conventional packaging to retail displays.

**Contributor:**

**Robert G. Chua**

**Proprietor**

**Robble Trading –**

**The Mango Specialist**

**Cebu City, The Philippines**

# Government-Private Sector Initiative on Packaging Services

## A Fish Port with Packing & Packaging Facility Boosted Tuna Industry



Information Source: Website of General Santos City, Philippines  
& Actual Site Visit

# R&D Institution Led Product Branding

*Repositioning Native Potatoes  
As Gourmet and Health Food  
Through Branding Made Possible  
by Appropriate Packaging*



**International Potato Center Led Initiative**

# Packaging Innovations in Developing Countries

## Bags from Fruit Waste (Malaysia)



## Edible Food Packaging (Turkey)

*A product of the Turkish Scientists research using more flexible film compared to competing products on the market. The flexible film is made using egg white and Corn rotein and natural substances and can kill microbes in food. The new packaging is 500% more flexible than Those currently on the market, as claimed And will soon be produced three to four years hence.*

*Featured in Packaging Gateway, May 2010 issue.*

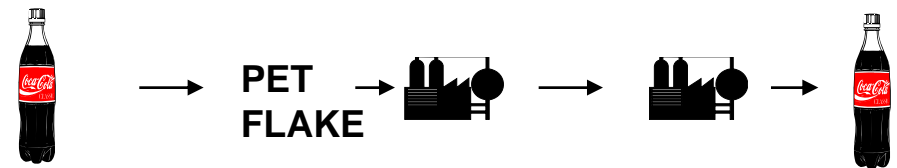
# Sustainability Initiatives Of Private Industries in Developing Countries

## Packaging Management for Sustainable Environment Federation of Thai Industry

*In Thailand processed and nicely packed food products are enticing tourists, The Thailand Institute of Packaging Management for Sustainable Environment (TIPMSE) in 2005 was established by four industry clubs under the Federation of Thai Industries namely; the Plastic Industry Club, the Pulp and Paper Industry Club, the Glass Industry Club, and the Aluminum Industry Club. The Thai Metal Packaging Association & other related consumer product manufacturers also participated. TIPMSE aims to reduce packaging wastes via safety and sustainable methodology by 12% in five years*

*(Thailand Country Report, 2008).*

## PET Recycling in the Philippines San Miguel Corporation (SMC)



*The aim is to significantly increase the usage of recycled PET in food packaging applications in order to significantly reduce dependence on virgin PET resin*

# Findings

- On the Importance of Packaging

- On Packaging & Food Loss on Value Chains

On Packaging Trends & Potentials for Development

# Findings

## On the Importance of Packaging

- Packaging and packaging solutions help address **Food Loss** , a major global concern
- Packaging is one of the crucial keys to food loss reduction which is relevant to both:
  - the poor smallholder food producer &
  - the poor food insecure producer
- Packaging functions from mere protection to include : promotion, information, convenience, innovation & handling
- Packaging becomes an added P to the 4Ps of Marketing (product, price, place & promotion)
- Packaging Industry Ranks 3<sup>rd</sup> (next to food & Petrochem)
- 3-5% annual growth rate (higher than GDPs of nations)

# Findings

## On Packaging & Food Loss on Value Chains

- Packaging spans the entire value chain & is a shared responsibility for all (trading partners )
- Products generally represent greater resources and have higher inherent value than the packaging used to protect them: thus product losses due to underperforming packaging could cause greater adverse effects on the environment than the gains made through packaging reduction
- Knowing what the losses are as well as where and how they occur could pinpoint solutions, packaging included, to minimize losses, the same way that knowing which packaging solutions are available, is a crucial first step in addressing food loss (Ex, developed economies food loss /waste are at retail & consumption level, for developing economies, its at postharvest and distribution level)

# Food Packaging Solutions

Loss situation and causes		Selected packaging solutions
unnecessary variety of packaging types; high amount of GHG emission per ton of production; non-recyclable wax-coated boxes for delicate perishables	<b>production</b>	universal packaging design; modified atmosphere packaging; integrated materials handling and warehouse management system
insufficient product insulation; manual Case forming and stretch wrapping; product Spoilage and toxicity	<b>post harvest</b>	fibre reduction; microflute technology; automated process reducing labor and material costs; anti-microbial packaging
Damage due to palletizing and strapping; Damage due to mixed products and strapping	<b>distribution</b>	slip sheets and stretch wrapping in lieu of pallets and strapping; cube utilization via 'pin-wheeled' position
Damage during transport; product Spoilage; loss of production	<b>processing</b>	leak resistant packaging; tough, tear resistant packaging; hermetic seals, efficient equipment system
Inappropriate shipping containers; damage due to high humidity, storage time and stacking height	<b>wholesale</b>	optimizing secondary packaging for shipping and shelf impact/appeal; use of new materials with high stacking strength
In-store preparation losses; product Spoilage; passed sale date	<b>retail</b>	in the bag merchandizing; leak resistant packaging; shelf-life extension; freshness preservation
Too much preparation; spoilage; not consumed prior to expiration date	<b>consumption</b>	portion control packs; ready-to-eat entrees; re-sealable packaging; shelf-life extension; freshness preservation

# Findings

## On Packaging Trends

&

## Potentials for Development

- The increasing dynamism in the food system poses challenges as well as opening up opportunities and potentials for the packaging industry
- Processing traditional export commodities at country source is on the rise, the need for new consumer-packed products from developing countries to world market poses challenges in terms of
  - marketing directly to consumers in target markets
  - using own brand names
  - maintaining competitive packaging designs of high quality levels,challenges spilling over to the packaging industry in DC
- Given the tendency of packaging manufacturing firms to move nearer to their customers, investment potentials for developing countries abound in this sector
  - specifically if ethnic appeal of products (F&V) is capitalized on
  - and if extended to packaging as well -indigenous materials (generally lacking in strength) for packaging, may be used in combination with other materials aided by research and technological advancement
- Container standardization is getting to be a cost reduction strategy, has given rise to a wider range of package sizes to accommodate the diverse needs of the industry and consumer sectors alike.

# Packaging Potentials For Development

High Potentials exist as packaging materials are in short supply in developing countries, relaxing packaging regulations a bit without sacrificing food safety will surely help

Package Manufacturing

Packaging Machinery

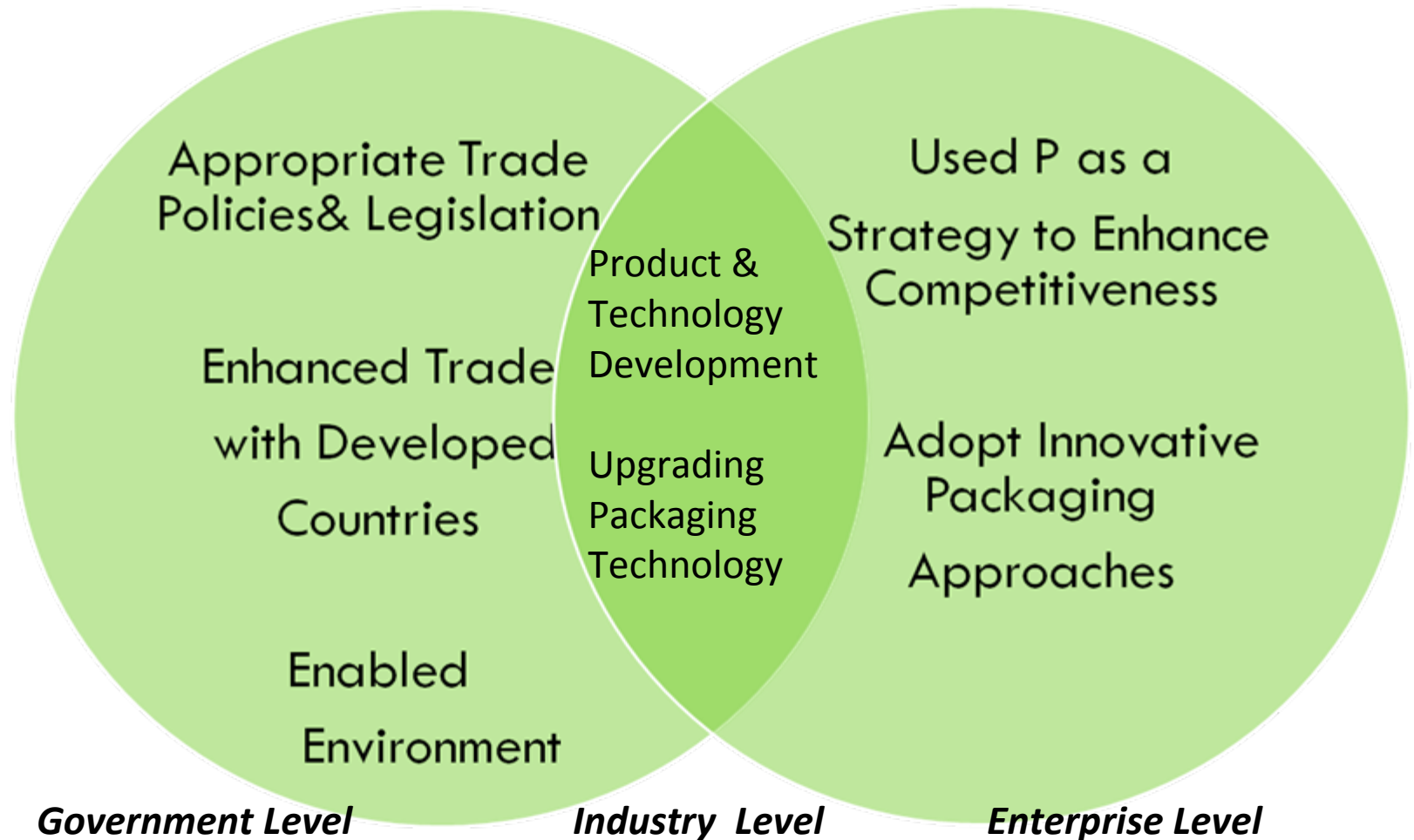
Packaging Services

Developing the Packaging Industry In The Developing Countries

Potential for 2<sup>nd</sup> hand machinery market exist (short/medium term.) Local fabrication of appropriate packaging machineries may work best in the long term.

Developing the packing service provision subsector, specifically the pre-packing & out sourcing will provide the much needed boost

# Food Packaging Solutions For DC



# How Well Industry Promises are Delivered

**We do more**

**We provide solutions**

**Pack your trust**

**The Economic solution**

**Proven innovation powerful commitment**

**Tommorow's efficiency today**

# Providing Solutions

While prospects are bright for the growth of the packaging industry sector in developing countries, it will be for the good of the industry, the stakeholders comprising it and society at large if :

*focused packaging solutions*

*that take into account sustainability concerns*

*are provided to meet the sector's needs.*

This will not only save on costs to the stakeholders and help address food loss but will be good for the environment as well .



**Thank You**