Resource Efficiency in Food Chains

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Professor, School of Business Studies
Punjab Agricultural University Ludhiana
Presentation Tour

- Punjab Agriculture: Contribution
- Green Revolution and Present situation
- Resource Utilization in food Supply Chain
- Major Issues
- Way Forward
- Case Studies
Punjab Agriculture: Contribution

• Geographical area: 5.03 m ha; Net sown area: 4.2 m ha (83.5%)

• Punjab with 1.53% of India’s geographic area produces about 19% of wheat, 10% of rice, and 5% of cotton

• Contributes about 23.6% of the State’s GDP (crops 15.3% + live stock 8.3%) (17% at national level)

• Number 1 contributor to central food grain pool
  - up to 78% of wheat, 1968-69 (75% in 2005-06)
  - up to 59% of rice, 1979-80
• State produces 2% of rice, 3 % of wheat and 1% cotton of the world.

• Provides livelihood to 50-55% of rural population

• State has the highest irrigated area (99.9%) and the highest cropping intensity (204%).

• State surpassed all previous records in wheat production during *Rabi (Winter)* 2011-12 and rice production in *Kharif (Summer)* 2017-18.
Green Revolution


- The term ‘Green Revolution’ refers to a phenomenal increase in food production (mainly wheat and rice) during late 1960’s in certain regions of the world especially South East Asia.
A spectacular increase in production of wheat and rice during 1960s and 1970s in Punjab

<table>
<thead>
<tr>
<th>Crop</th>
<th>Year</th>
<th>Yield (q/ha)</th>
<th>Production (M. ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>1960-61</td>
<td>12.4</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td>1970-71</td>
<td>22.4</td>
<td>5.14</td>
</tr>
<tr>
<td>Paddy</td>
<td>1960-61</td>
<td>15.5</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>1970-71</td>
<td>27.7</td>
<td>1.03</td>
</tr>
</tbody>
</table>
Green Revolution: Main Factors

• New technologies
• Fertilizers
• Tubewell irrigation
• MSP and Procurement
• Roads and markets
• Credit
Rice followed Wheat in 1970s

- IR 8 seed obtained for planting in 400 ha (1969)
- 100 per cent rural electrification in Punjab inaugurated by Smt. Indira Gandhi, then PM on 31.5.1976 that paved the way for promotion of rice cultivation in the state
- Land reclamation (6 lac ha in 1970) helped in area expansion under rice
ISSUE : Water Use

• Punjab neither ecologically suited nor consumer of rice
• Rice cultivation promoted by National Policy to meet food security needs
• MSP (Rs/Kg) : Paddy (0.52) vs wheat (0.76) during 1967-68
  Paddy (15.50) vs wheat (17.35) during 2017-18
• Free electricity supply to tubewells

• Area under rice expanded quickly
WHY  ?????
For use of American Food, the authors classified the under-developed nations as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti</td>
<td>Can’t be saved</td>
</tr>
<tr>
<td>Egypt</td>
<td>Can’t be saved</td>
</tr>
<tr>
<td>India</td>
<td>Can’t be saved</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Should receive food</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Should receive food</td>
</tr>
<tr>
<td>The Gambia</td>
<td>Walking wounded</td>
</tr>
<tr>
<td>Libya</td>
<td>Walking wounded</td>
</tr>
</tbody>
</table>
Lal Bahadur Shastri, then Prime Minister, gave an appeal in 1965 to miss one meal on all Mondays. All hotels, restaurants, road-side eateries were appealed to close down on Monday nights. Even state dinners were banned on Mondays. Was known as “Shastri Vrat”.

Miss-A-Meal Campaign In Punjab
From Our Correspondents

AMBRIAR, Nov. 2.—In response to the Prime Minister’s appeal, nearly 90 per cent of the adult citizens of Amritsar numbering 60,000 missed the midday meal yesterday. No food was served in hotels, restaurants, dhabas and tandoors. The Dhabah and Tandoor owners have decided not to serve any meal every Monday.

T. N. Singh, Union Minister for Industry, who was here on official duties, decided to forgo his lunch on his” day and had it specially invited by a leading mill-owner, Government officials, school teachers and young people also missed their midday meal.

LUDHIANA: The first Monday miss-a-meal campaign met with encouraging response in Ludhiana. A large number of families and shops did not take cereals in the morning.

SONEPAT: The miss-a-meal campaign got off to an encouraging start yesterday when thousands of people in the Sonepat tehsil went without a meal.

IT WASN’T A PATTON

From Our Correspondent

AMBALA, Nov. 2—A rumour that a Pakistani Patton tank captured by the Jowans was in the Ambala Cantonment railway yard, sent thousands of people rushing to the railway station to have a look at the war trophy yesterday. But ultimately it turned out that the object of their curiosity was not a Patton tank but an observer carrier, on its way to Delhi.
Govt. Appeal in *Preetlari* - 1966

[Image of an appeal notice with text in Hindi]

*Image description:*
- The image contains text in Hindi script.
- The text appears to be an official announcement or a notice.
- The layout includes decorative elements typical of official documents.

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**Govt. Appeal in Preetlari - 1966**

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*Note: The actual content of the text on the image is not transcribed due to the image's resolution and the need for specialized knowledge to accurately translate the text.***
Impact of varieties on wheat production in Punjab

Wheat production (mt)

PV 18 (1966)
KALYANSONA (1967)
WL 711 (1976)
HD 09 (1977)
HD 2329 (1985)
PBW 343 (1995)
PBW 550 (2007)
HD 2967 (2011)
HD 3086 (2015)
Impact of varieties on Paddy Production (Punjab)

Paddy Production (mt)

Year


0.35 0.44 1.03 2.17 4.85 8.23 9.76 10.27 13.74 15.31 16.25 17.71 18.86


Impact of varieties on Paddy Production

Varieties:
- Pusa Bas 1 (1990)
- PR 118 (2003)
- PR 114 (1999)
- PB 1121 (2008)
- PR 121 (2013)
- PR 126 (2016)
- IR8 (1968)
- PR 106 (1976)
Punjab followed intensive agriculture to meet National Food Security Needs

<table>
<thead>
<tr>
<th>Year</th>
<th>Food grain production (Million tons)</th>
<th>Cropping intensity (%)</th>
<th>Irrigated area (%)</th>
<th>Fertilizer use (N+P+K) (kg/crop ha)</th>
<th>Insecticide/Pesticide use (tons of Tech. grade)</th>
<th>Number of tractors (‘000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>3.2</td>
<td>126</td>
<td>54</td>
<td>1</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1970-71</td>
<td>7.3</td>
<td>140</td>
<td>71</td>
<td>38</td>
<td>NA</td>
<td>53</td>
</tr>
<tr>
<td>1980-81</td>
<td>11.9</td>
<td>161</td>
<td>93</td>
<td>113</td>
<td>3200</td>
<td>119</td>
</tr>
<tr>
<td>2010-11</td>
<td>27.8</td>
<td>190</td>
<td>98</td>
<td>243</td>
<td>5600</td>
<td>504</td>
</tr>
<tr>
<td>2016-17</td>
<td>30.7</td>
<td>204</td>
<td>99***</td>
<td>247*</td>
<td>5721*</td>
<td>472**</td>
</tr>
</tbody>
</table>

*2015-16; ** 2014-15; *** 14 lakh tube wells of which 12.3 lakh electric
### Punjab is the Leader in Agriculture

**Highest Productivity**

Wheat + Paddy: 11.60 t/ha (2017-18)

#### Dependence on Punjab Increases when National Foodgrain Production Falls

<table>
<thead>
<tr>
<th>Year</th>
<th>National Foodgrain production Million t</th>
<th>Share of Punjab in wheat (%)</th>
<th>Share of Punjab in rice (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-04</td>
<td>213</td>
<td>55</td>
<td>38</td>
</tr>
<tr>
<td>2004-05</td>
<td>198</td>
<td>61</td>
<td>37</td>
</tr>
<tr>
<td>2005-06</td>
<td>209</td>
<td>75</td>
<td>32</td>
</tr>
<tr>
<td>2008-09</td>
<td>234</td>
<td>38</td>
<td>26</td>
</tr>
<tr>
<td>2009-10</td>
<td>218</td>
<td>43</td>
<td>35</td>
</tr>
</tbody>
</table>
Footprints of Green Revolution

• Water
  – Depletion of ground water
  – Adverse effect on water quality

• Soil health
  – Mining of nutrients and their export
  – From FYM to chemical fertilizers
  – Development of hard pan

• Pesticides and Electricity
  – Over use

• Mechanization
  – Under use of tractors

• Environment
  – Burning of crop residue
  – Overuse of agro-chemicals

<table>
<thead>
<tr>
<th>Yield (q/ha, 2016-17)</th>
<th>Wheat</th>
<th>Paddy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>50</td>
<td>62</td>
</tr>
<tr>
<td>India</td>
<td>32</td>
<td>38</td>
</tr>
</tbody>
</table>
**ISSUE: Water Table Decline in Punjab is a Reality**

Research Based Enactment of **Preservation of Sub-soil Water Ordinance Punjab (2008)** (Paddy transplantation to start after June 10/15)

<table>
<thead>
<tr>
<th>Period</th>
<th>Average decline (cm/year)</th>
<th>Average Rainfall (cm)</th>
<th>Area under Paddy (Million Ha)</th>
<th>Total Tube wells (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1990- June 2000</td>
<td>25</td>
<td>64 *</td>
<td>2.25</td>
<td>0.92</td>
</tr>
<tr>
<td>June 2000- June 2008</td>
<td>84</td>
<td>39</td>
<td>2.61</td>
<td>1.15</td>
</tr>
<tr>
<td>June 2008- June 2014</td>
<td>50</td>
<td>53</td>
<td>2.73</td>
<td>1.33</td>
</tr>
<tr>
<td>June 2014- June 2017</td>
<td>60</td>
<td>50</td>
<td>2.97</td>
<td>1.41</td>
</tr>
</tbody>
</table>

2008-2014 Preservation of Sub-Soil Ordinance Punjab  
2014-2017 Increase in paddy area*
## Water Resources of Punjab

<table>
<thead>
<tr>
<th>Source</th>
<th>Water Available (M ha m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal water (Head Works)</td>
<td>1.79</td>
</tr>
<tr>
<td>Canal water (Outlet)</td>
<td>1.45</td>
</tr>
<tr>
<td>Groundwater</td>
<td>2.34</td>
</tr>
<tr>
<td>Annual available water</td>
<td>3.79</td>
</tr>
<tr>
<td>Annual water demand</td>
<td>4.41</td>
</tr>
<tr>
<td>Deficit</td>
<td>0.62</td>
</tr>
</tbody>
</table>
## NPK Use in Punjab

<table>
<thead>
<tr>
<th>Year</th>
<th>Use (kg/ ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>169</td>
</tr>
<tr>
<td>2005-06</td>
<td>214</td>
</tr>
<tr>
<td>2010-11</td>
<td>243</td>
</tr>
<tr>
<td>2011-12</td>
<td>243</td>
</tr>
<tr>
<td>2012-13</td>
<td>251</td>
</tr>
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<td>2013-14</td>
<td>218</td>
</tr>
<tr>
<td>2014-15</td>
<td>213</td>
</tr>
<tr>
<td>2015-16</td>
<td>247</td>
</tr>
</tbody>
</table>

- High yield
- 60-70% of wheat and rice exported out of state
- Burning of residues
Intensive agriculture uses high level of nutrients

Besides Overuse of NPK

- Deficiency of micro-nutrients
  - Zinc (20%)
  - Manganese (18%)
  - Iron (12%), etc

- Solution: Practice INM
  - FYM
  - Compost
  - Green manuring
  - Biofertilizers
  - Crop residue incorporation

- Soil Test based N application

- Leaf Colour Chart (rice, wheat, maize)

Constraint:
Farmers compete for yield rather than profit
Consumption of Insecticides (tons) in Punjab

Integrated Pest Management

- Bio-control: *Trichogramma, Trichoderma*

Year | Consumption (tons)
--- | ---
2001-02 | 3800
2004-05 | 3298
2005-06 | 2495
2007-08 | 2690
2009-10 | 2602
2011-12 | 2340
2012-13 | 2390
2013-14 | 2389
2014-15 | 2367
2015-16 | 2373
2016-17 | 2347
## Crop Productivity

<table>
<thead>
<tr>
<th>Years</th>
<th>Wheat</th>
<th>Paddy</th>
<th>Maize</th>
<th>Cotton (lint)</th>
<th>Sugarcane</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>12.4</td>
<td>15.5</td>
<td>11.4</td>
<td>2.7</td>
<td>365</td>
</tr>
<tr>
<td>2001-02 to 2010-11</td>
<td>43.5</td>
<td>57.4</td>
<td>30.3</td>
<td>6.3</td>
<td>596</td>
</tr>
<tr>
<td>2011-12 to 2017-18</td>
<td>48.4</td>
<td>60.0</td>
<td>37.8</td>
<td>5.6 (6.2)*</td>
<td>757</td>
</tr>
</tbody>
</table>

* Excluding 2015-16

Recent gluts: Basmati, Potato, Pea, Carrot, Cauliflower
Major Issues facing Punjab
### PUNJAB SCENARIO

<table>
<thead>
<tr>
<th>Area under paddy</th>
<th>≈ 3.0 M ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy straw produced</td>
<td>≈ 20 MT</td>
</tr>
<tr>
<td>Burnt</td>
<td>≈ 85 %</td>
</tr>
</tbody>
</table>

- Area under paddy: ≈ 3.0 M ha
- Paddy straw produced: ≈ 20 MT
- Burnt: ≈ 85 %
Active fire locations detected in Punjab on 7 November 2016

Active fire locations detected in Punjab on 4 November 2017

Source: Punjab Remote Sensing Center
Straw Burning
Straw Burning
PADDY STRAW BURNING: Why?

1. Paddy harvesting leaves 6-7 ton straw per ha and is surplus

2. It is a low density stuff

3. Next crop, mainly wheat is to be planted in 20-25 days

4. No time for Potato and other vegetable crops

5. Handling 7 ton/ha, needs equipment (capital), additional energy (money) and time
# EFFECTS OF PADDY STRAW BURNING/ REMOVAL

## NUTRIENT LOSS

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Kg/ ton</th>
<th>Kg/ ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>5.5</td>
<td>33.0</td>
</tr>
<tr>
<td>Phosphorus (partial in burning)</td>
<td>2.3</td>
<td>13.8</td>
</tr>
<tr>
<td>Potash (Negligible in burning)</td>
<td>25.0</td>
<td>150</td>
</tr>
<tr>
<td>Sulfur</td>
<td>1.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Micronutrients</td>
<td>10-20</td>
<td>60-120</td>
</tr>
<tr>
<td>Soil organic carbon</td>
<td>400</td>
<td>2400</td>
</tr>
</tbody>
</table>

- ✓ Deterioration of soil physical health
- ✓ Health hazards and accidents
- ✓ Air pollution and green houses gases
- ✓ Loss of micro-biodiversity
Crop Residue Management

Total paddy straw: 20 million t
Burning: 85%

- Loss of nutrients and organic matter:
  > 80% of C, N and S
  Other nutrients are lost partially (10-20%)

- Loss of soil microbes
- Environmental pollution
- Health and other hazards

Options for straw management:
- Incorporation
- Mulches
- Removal
  - Bioenergy, Biogas, Mushroom, Card board, etc.
- In situ biodegradation
Machinery for Paddy Straw Management

• Happy Seeder
• PAU Super SMS
• PAU Straw Cutter – cum - Spreader
PAU Happy Seeder

Wheat sown with Happy Seeder

Wheat sown with modified Happy Seeder
PAU Super SMS

For chopping and spreading of loose straw coming out of combine to facilitate operation of Happy Seeder

PAU Straw Cutter- cum- Spreader

For chopping and spreading of loose straw and standing stubbles after combine harvesting to facilitate operation of Happy Seeder
Climate Change

In Punjab, during the last 40 years:
• Minimum mean temperature increased by 1° C
• Relative humidity increased
• Rainy days decreased
• Green House Gases (CO₂, CH₄ and N₂O)

Effect of enhanced temperature
- Early flowering and maturity affecting yield
- Decline (5-7%) in wheat yield for every degree increase in temperature
- Horticultural crops requiring chilling will be affected
- Incidence of pests and diseases

Effect of enhanced carbon dioxide
- Will be beneficial in photosynthesis particularly for C₄ plants
**Post Harvest Losses (National)**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Crops</th>
<th>Wastage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cereals</td>
<td>4.65- 5.99</td>
</tr>
<tr>
<td>2.</td>
<td>Pulses</td>
<td>6.36-8.41</td>
</tr>
<tr>
<td>3.</td>
<td>Oil seeds</td>
<td>3.08-9.96</td>
</tr>
<tr>
<td>5.</td>
<td>Milk</td>
<td>0.92</td>
</tr>
<tr>
<td>6.</td>
<td>Fisheries</td>
<td>10.52</td>
</tr>
<tr>
<td>7.</td>
<td>Poultry Meat</td>
<td>6.74</td>
</tr>
</tbody>
</table>

Value of Food Products waste : £ 5 billion  
Onion wastage = 1 million tonnes  
Tomato wastage= 2.2 million tonnes
Infrastructure bottlenecks in Supply Chains

• Grains (State dominated)
  – Max 45 days to clear Wheat and Paddy from fields to storage places (Approx. 18 Mt each)
  – Old technology in storage
  – Inadequate storage facilities- open storage
  – Fortified Wheat- separate supply chain

• Fresh Fruits and Vegetables
  – Market places inadequate and inefficient
  – Cool Chains missing or inadequate
  – Product specific cold chains- Potato
### Agrarian Crisis

#### Average Monthly Income of Agricultural Households, 2012-13

(Rs/ Household)

<table>
<thead>
<tr>
<th>State</th>
<th>From agriculture</th>
<th>From other sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>16349 (90.5%)</td>
<td>1710 (9.5%)</td>
</tr>
<tr>
<td>Haryana</td>
<td>10916 (75.6%)</td>
<td>3518 (24.4%)</td>
</tr>
<tr>
<td>Bihar</td>
<td>1904 (53.5%)</td>
<td>1654 (46.5%)</td>
</tr>
<tr>
<td>India</td>
<td>3350 (52.1%)</td>
<td>3076 (47.9%)</td>
</tr>
</tbody>
</table>

Source: NSSO, 2013

Income increasing, net profit decreasing
WAY FORWARD
Diversification

- Punjab can sustain only 13.5 lakh ha paddy
- Replacement of about 16 lakh ha to other crops
- Diversification options:
  - Maize, Cotton, Sugarcane, Pulses, Fruits and Vegetables, Fodder

Constraints:
- Less demand, high marketing risk, Less profitable
- High production risk, less mechanized
- Climate change

What is required: A Level Playing Field in terms of policy support:
- Remunerative prices
- Assured marketing for alternatives
- Demand creation
- Technology required
  - Productivity increase in maize, cotton, pulses, vegetables and fruits
- Value addition and processing
- Farm machinery
  - Maize planter and dryer, Sugarcane harvester, Cotton picker

Diversification is required for sustainability and may/may not enhance income
Diversification: Promotion of Horticulture

Area (in thousand ha)

<table>
<thead>
<tr>
<th>Year</th>
<th>Vegetable</th>
<th>Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>110</td>
<td>34</td>
</tr>
<tr>
<td>2011-12</td>
<td>180</td>
<td>69</td>
</tr>
<tr>
<td>2017-18</td>
<td>260</td>
<td>84</td>
</tr>
</tbody>
</table>

- Poly net-house for capsicum, tomato, brinjal, cucumber and papaya cultivation (High yield, increased availability span, better quality)
- Diversification in mandarins with the release of Daisy Tangerine and W. Murcott (2013)
- Promotion of Guava cultivation (Punjab Safeda, Punjab Kiran – 2018)
<table>
<thead>
<tr>
<th>Character</th>
<th>PAU Kinnow 1</th>
<th>Kinnow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed number/ fruit</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Range (bold seed No.)</td>
<td>0-9</td>
<td>12-36</td>
</tr>
<tr>
<td>TSS (%)</td>
<td>10.6</td>
<td>10.6</td>
</tr>
<tr>
<td>Acidity (%)</td>
<td>0.82</td>
<td>0.84</td>
</tr>
<tr>
<td>Juice content (%)</td>
<td>48.5</td>
<td>47.8</td>
</tr>
</tbody>
</table>
Milk Production Trends in Punjab

Per Capita Availability of Milk (g/day)
Small scale Agro-processing Complexes for value addition at village level generate employment for rural youth and make quality food material available locally.

**Machines –**
1. Mini rice mill
2. Mini Flour Mill
3. Baby oil expeller
4. Spices grinder
5. Cattle feed mill

**Cost of the complex** – Rupees 15 to 20 lakh
**Profit per month** – Rupees 50,000 to 80,000

Total number of such complexes working in Punjab – 295

Such complexes shall have to be Area Specific.
TIGR2ESS

• Why?
• How?
CASE STUDIES
Case Study

KINNOW
Kinnow

- Area: 60,000 ha
- Produce: 1 million tones
- Channel

Target: Exporting 20,000 tonnes of Kinnow to CIS and other countries through Reefer Chain (temperature 5-7 degree Celsius)
Coating of Kinnow
Storage of Kinnow in commercial cold storage (5-6°C) at Kailash cold storage Ludhiana

Storage life 45 days at 5-7°C temperature and 90-95% RH.
Packaging for retail marketing

Shrink Film Packaging of kinnow Fruits
After 2 weeks of storage
Bee-keeping in Punjab

- Apiary size: 100 *Apis mellifera* colonies (35000 bee keepers)

- Estimated Profit ~ Rs. 3,20,000 per year
Vertically Integrated Transnational firms

Producers

Merchant exporters

Domestic FMCG firms

Processor

Traders

Equipment suppliers

Bee-breeder

Local sales

Organized retailers

Overseas Marketing and Distribution

Overseas importers

Wholesalers

Stockists

Retailers

Honey Value Chain
Case Study

*KANDI* FRUIT AND VEGETABLE CLUSTER
Stakeholder map of the kandi fruit and vegetable cluster

Primary producers → Aggregators → Processing subcontractors → End Product Processors

Research and Development:
- Indian Institute of Sugarcane Research, Lucknow (IISR)
- Kelkar's Scientific Research Centre, Mumbai (KSRC)
- Punjab Agricultural University (PAU)
- Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (GADVASU)
- Institute for Himalayan Bio-resources Technology, Palampur (IHBT)

International Market
- Honey processing equipment manufacturers
- Packaging material manufacturers
- Transport and freight services

Domestic / Local Market
- Domestic organised retail chains

Farmers' Associations

Domestic

Organised

Retail chains
Fruit and Vegetable Value Chain

Primary Producers
Input Suppliers
Primary Processing
Domestic FMCG firms
Domestic marketers and distribution
Local Mandi sales
Wholesalers
Stockists
Retailers
Organized retailers
Overseas importers
Exporters
Aggregators
Final Processor
Thanks