Mainstreaming Indigenous Fruits & Vegetables for food & nutrition secure future (Perspectives: India)

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Indian Agriculture has made Rapid Progress since Independence

What we achieved in food grains and horticulture
(Base year 1950-51 to 2020-21)

- 6 times Food grains (50 to 306 million ton)
- 13 times Horticulture (25 to 331 million ton)
- 2014-15 (280 million ton) 49 million ton more

Green revolution, 2\textsuperscript{nd} Green revolution: Food Self sufficiency

Silent revolution took place: Nutrition & Health
Horticulture Scenario in India

- India is 2nd largest producer of fruits & vegetables in the world.

- India’s share in the world production of fruits and vegetables stands at 11.38% and 11.78% respective.

- Horticulture: Area 27.23 million hectare, production 331 million ton.

- Largest producer: Mango, Banana, Guava, Papaya, Lemon & Lime, Okra in the world.

- Second largest producer: Potato, Tomato, Onion, Cabbage, Cauliflower and Brinjal in the world.
India today is the 5th largest and fastest growing vegetable seed market in the world worth Rs. 6 billion.

<table>
<thead>
<tr>
<th>Horticulture Items</th>
<th>Export value (Million US $)</th>
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</thead>
<tbody>
<tr>
<td>Fresh fruits</td>
<td>674.53</td>
</tr>
<tr>
<td>Fresh Vegetables</td>
<td>661.61</td>
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<tr>
<td>Floriculture, Fruits &amp; Vegetable seeds</td>
<td>186.63</td>
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<tr>
<td>Processed fruits, pulps, juices, beverages, Cocoa products</td>
<td>4987.76</td>
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<tr>
<td>Processed vegetables including Cucumber &amp; Gherkins</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>6510.53</strong></td>
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**EXPORTS** (2020-21) worth 6510.53 million US$ Rs. 47463 crore
Promotion of Exotic and Indigenous Crops

- Identified 10 globally popular exotic fruit crops of commercial importance.
- Identified 10 important Indigenous fruit crops with high nutritional and nutraceutical properties.
- State Horticulture Missions have been given targets for area expansion during 2021-22.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Exotic Fruit crops</th>
<th>Niche Fruit crops</th>
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<tbody>
<tr>
<td>1.</td>
<td>Avocado</td>
<td>Aonla</td>
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<tr>
<td>2.</td>
<td>Blue berry</td>
<td>Karonda</td>
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<td>3.</td>
<td>Dragonfruit</td>
<td>Seabuckthorn</td>
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<td>4.</td>
<td>Fig</td>
<td>Garcinia</td>
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<tr>
<td>5.</td>
<td>Kiwi</td>
<td>Jamun</td>
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<tr>
<td>6.</td>
<td>Mangosteen</td>
<td>Hanuman Phal (Soursop)</td>
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<tr>
<td>7.</td>
<td>Persimmon</td>
<td>Bael</td>
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<tr>
<td>8.</td>
<td>Passion fruit</td>
<td>Tamrind</td>
</tr>
<tr>
<td>9.</td>
<td>Rambutan</td>
<td>Phalsa</td>
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<tr>
<td>10.</td>
<td>Strawberry</td>
<td>Jack fruit</td>
</tr>
</tbody>
</table>
Key Technologies: Transformed horticulture

- Hybrid seeds of vegetable crops
- Plant architecture & engineering
- Root stock technology & trellis system
- Accredited Nurseries
- Drip and sprinkler systems and fertigation (13 million ha)
- Greenhouses technology (Polyhouse, shadenet, low tunnel, mulching) (130 thousand ha)
- Biopesticides & biofertilizers (825 thousand tons)
- Micro-propagation and tissue culture in plant production
- Integrated cold chain

DESHACKLERS

- Back up of Technologies
- Development Initiatives
- Policy Support
High Production achieved but Safe Value Chain is in focus?

Production

Postharvest Handling

Food Safety & Nutritional Value

Consumption

Information Exchange
IMPROVE NUTRIENT CONTENT?

- By the Appropriate production system
- By Plant Breeding
NEW MOLECULES: NEW PESTICIDE CHEMISTRIES & INTEGRATED PEST MANAGEMENT

• **Crop Grouping concept:** Label claim expansion for related crops in groups.

• **Biopesticides:** 13
  - *Trichoderma, Beauvaria, Verticillium, Pseudomonas, Bacillus, Metarhizium, Paecilomyces*
  - 5 lakh MT traded 143 million US$

• **Environmentally safer pesticides:**
  - Polyoxin (fungistatic)
  - Spinosad (insecticide- Lepidopterean)
  - Spinetoram (Thrips, caterpillar, ball worm)

• **Gossylure:** Pheromone : Mating disruption
Own certification system - IndGAP?

- Safe, healthy and quality food from farm to fork
- Traceability, Environmental protection
- Certification of production to ensure sustained supply of quality produce.
- Common minimum standards for India GAP benchmarked with GlobalGap
- India took lead in development of WHO-FAO CODEX standards for AUBERGIN, OKRA, POTATO
Horticulture Cluster Development Program

- **12 clusters identified**
- Shopian, Kinnaur for **apple**
- Sholapur, Chitradurga for **pomegranate**
- Theni, anantpur for **banana**
- Mehboobnagar, Kutch, Lucknow for **mango**
- Nashik for **grapes**
- Sepahijala for **pineapple**

- Increased productivity
- GAP
- Infrastructure development
- Multimodal transport
- Cluster brands
- Increase in investment by private sector
- Quantum for export
National Bee and Honey Mission

Honey Testing Lab inaugurated at Anand, Gujarat on 24 July, 2020 & 20 May 2021 at IARI Delhi

Regional labs: 5
Gujarat
Karnataka
IARI New Delhi
Launching of MADHUKRANTI portal & Honey Corner

Launching of MADHUKRANTI portal for Traceability of Honey and other beehive products on 07.04.2021
Perspectives to Look Upon

• Expand the harvesting window - mainstream F&V even during offseason - increased availability

• Development of nutrient dense biofortified varieties to compete with mainstream - Studies on secondary metabolites

• Utilizing waste of large fruit drop for extracting nutriceuticles

• Considering perennial fruit crops as source of environmental services – as an alternative for carbon offset option

• Production epicenter based digitalized mapping for introduction in non-conventional areas – for crop suitability

• Utilizing microbial power for rhizosphere manipulation as resilience against ongoing nutrient mining as well as biocontrol for pests
THANK YOU

• India proposal accepted in UN General Assembly

• Next will be International Year of Millets-2023